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COMPUTERWORLD

Apple, Microsoft barbs stoke feud

By Mark Halper, Stuart J. Johnston and Mitch Betts

The doyens of the PC industry verged on civil war last week as Microsoft Chairman Bill Gates shot off an angry letter in response to Apple statements that excoriated Microsoft for "bullying" tactics.

Apple made those charges in a letter to U.S. District Court Judge Stanley Sporkin. It was made public last week.

Gates, in a letter to Apple Computer, Inc. CEO Michael Spindler, condemned Apple's "lack of candor and honesty" and counterattacked charges that Microsoft Corp. does not operate in good faith. Gates also methodically responded to Apple allegations that Microsoft had threatened to deny Apple access to Windows 95 beta code unless Apple dropped both its long-standing user interface suit and its more recent video software suit against Microsoft and Intel Corp.



"I have firsthand evidence that Mr. Gates does resort to bullying tactics very often. He makes threats that are not so veiled — so he's a bully."

— JEAN-LOUIS GASSEE
FORMER APPLE EXECUTIVE

▶ SEE PAGE 16

Apple's charges

Barbs, *page 16*

Sun mail on tap

By Suruchi Mohae and Jean S. Bozman

SunSoft, Inc. plans to take an enterprise approach to delivering mission-critical mail when it announces its electronic-mail strategy this spring.

Sun considers mission-critical mail to be an enterprise application in which Sun servers will act as glue for many separate PC-based E-mail systems, SunSoft Vice President Jim Billmaier told analysts at a recent briefing.

"There are Unix E-mail desktops, and there are millions of PC-style mail systems out there. The problem the customer has is, 'How do I press Return and get this whole thing to solve itself?'" said Billmaier, who is also general manager of SunSoft's networking division in Mountain View, Calif.

Last week, Billmaier confirmed that Sun will make a big E-mail announcement later this year, but he would not say when. "What we're going to be doing in the area of E-mail goes far beyond E-mail for disconnected systems on a desktop," he said.

He said Sun will build on its already announced strategy to imbue the PC desktop with Unix services running on Unix servers. That strategy employs Sun's SolarNet software to combine PC clients with Unix servers.

Those servers will have inte-

Sun, *page 14*

E-mail link

Sun plans to make its Unix servers into networked mission-critical E-mail servers that link PC, minicomputer and mainframe E-mail systems now scattered across the enterprise.

Strategic technologies

Bank: IS costs break unit

By Julia King and Thomas Hoffman

Citing the high cost of information systems required to manage corporate investments, BankAmerica Corp., the nation's second largest bank, last week said it plans to sell its institutional trust division.

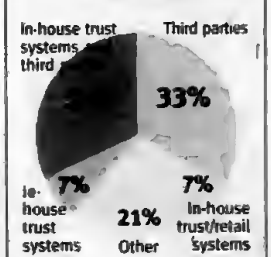
Industry analysts characterized the announcement as the first time in memory that a major bank has opted out of a multibillion-dollar market rather than invest in the computer systems necessary to compete within it.

The $64,000 question is why. And one answer is the estimated $50 million that BankAmerica reportedly needs to upgrade its trust division's technology.

"What's surprising is that Bank of America certainly has the resources to take on something like this. If they can't do it, it makes you wonder how the rest of these banks can," said DuWayne Peterson, a former chief information officer at Merrill Lynch & Co. and now president of Peterson &

BankAmerica, *page 133*

How banks expect to support trust processing in the next five years:



BASE: 50 OF THE 75 LARGEST U.S. BANKS

Source: Stuart Research, Cambridge, Mass.

Novell users boosted by bargaining power

By Laura DiDio

Large corporations migrating to NetWare 4.1 this year are upping the ante for Novell, Inc.

Businesses with 1,000-plus users are leveraging Novell's eagerness to get them to upgrade to 4.1, and they are using the threat of Microsoft Corp.'s Windows NT Server 3.5 to negotiate sweeter deals.

What users are asking for — and getting — are additional discounts of 10% to 20%, more flexible payment plans and extended service and support agreements.

Leveraging power

"We're absolutely going to use Windows NT Server 3.5 as a club to bludgeon Novell with and vice versa," said Jim Lisiak, a senior networking engineer at Chevron Information Technology Co., a division of Chevron USA, Inc. in San Ramon, Calif. "We've been on a downward spiral in terms of deteriorating service and support. But Microsoft is pulling out all the stops to woo our business."

Microsoft's inducements to Chevron Information include free consulting for both the operating

Novell, *page 12*

NetWare 4.x to NetWare 4.1 upgrade costs

50 users	$995
100 users	$1,395
250 users	$2,495
500 users	$3,195
1,000 users	$4,195

Source: Novell, Inc.

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Users opting for CDs

Discs ease software installation

By William Brandel

Don't tell Tim Everhart, assistant vice president at NationsBank, Inc. in Charlotte, N.C., that CDs do not net big savings today. And interest rates have nothing to do with it.

For Everhart and a growing number of users, buying software on compact disc rather than in the traditional shrink-wrapped box of up to 45 diskettes can reap big cost and time savings — not to mention freedom from the stacks of software boxes required to meet licensing rules.

Realizing that, some software heavyweights are hustling to bring innovations to market that exploit CD-ROM technology (see box page 133). These vendors stand to reap considerable savings by not copying software to dozens of dis-

CDs, *page 133*

RE-ENGINEERING TEAM of the YEAR

LOAN SURVIVORS

The plucky re-engineering team at Independence One Mortgage created a new loan origination process that has survived a corporate sale, three project champions and an industry crash. It also earned it COMPUTERWORLD's kudos for the top re-engineering effort.

MANAGEMENT, PAGE 88

A PUBLICATION OF IDG

What's Inside

February 27, 1995

NOTEBOOK GOLD RUSH

Notebook vendors are packing their products with dazzling features at lower prices, which in turn is saddling IS with support nightmares (see The CW Guide to Notebooks, page 97). Four high-performance notebooks ride high on screen readability, low in other areas (see Buyers' Satisfaction Scorecard, page 102).

MARKETPLACE: Color is within reach. Many dual-scan passive-matrix notebooks have dropped below the $2,000 level, and active-matrix systems have gone below $3,000. Page 123

NEWS

■ A new class of **PC-based servers** sets its sights on minicomputers. *Page 4*

■ The **Church of Scientology** comes up short in its internet copyright challenge. *Page 4*

■ **Sybase** plans to enhance **PowerBuilder** in early April to hoist the development tool up to enterprise status. *Page 6*

■ **Next's announcement** that it will port its products to Microsoft's Windows NT and Windows 95 brings peace to the minds of Next users. *Page 7*

■ **Ad hoc query tools** fall short of their original goal to allow end users to generate reports and manipulate corporate data on their own, according to IS staff members. *Page 10*

■ **X/Open** counts on software testing suites to unite the Unix community in its challenge to Microsoft. *Page 14*

■ **Pyramid Technology** plans a commercial massively parallel system. *Page 15*

■ **PeerLogic** and **IBM** will integrate the former's Pipes Platform with the latter's Distributed System Object Model. *Page 24*

■ **Individual PC users** are cluttering up their computers with old files, unread E-mail and personal software, creating a headache for IS managers. *Page 28*

■ Two recent acquisitions by **Silicon Graphics** reflect the company's philosophy of carefully focusing its resources. *Page 32*

DESKTOP COMPUTING

■ **Microsoft** hopes to break into one of IBM's remaining strongholds for OS/2, the **banking** industry. *Page 41*

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WORKGROUP COMPUTING

■ Benefits and risks may await users as the **Desktop Management Interface** standard comes together. *Page 53*

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■ **Around the Internet:** American Express takes a trip on the info highway with a travel service; 'net security concerns grow; a new product adds a voice to the Internet. *Pages 63 to 66*

LARGE SYSTEMS

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APPLICATION DEVELOPMENT

■ An Ohio agency's **client/server** project should make claims processing far more bearable. *Page 81*

MANAGEMENT

■ A mortgage company's **re-engineering** team creates a new loan process and overcomes adversity. *Page 88*

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■ **Feeling invisible?** Find out what gets management's attention at work. *Page 110*

COMMENTARY

■ The reviews are in on Judge Stanley Sporkin's move to block the **Microsoft** consent decree, and Charles Babcock, Paul Gillin, Patricia Seybold and Jeffrey Henning offer diverse opinions. *Pages 8, 36, 37 and 49*

SOUND OFF!

ARE ATM NETWORKS READY FOR PRIME TIME?

Two IS managers debate the issue. See In Depth, page 105.

How do you measure up?

How does your IS department compare with the Computerworld Premier 100? Fill out the Premier 100 survey, and we'll send you a free report showing how your operation compares with Premier 100 averages. Consolidated information from the surveys we collect may be published in a future Premier 100 issue. Send a request on company letterhead to Paul Gillin, Editor, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701 or E-mail to survey@cw.com.

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Executive Briefing

SunSoft plans to take an enterprise approach when it announces its E-mail strategy this spring. The announcement constitutes the company's response to **Hewlett-Packard**'s OpenMail offering and **Microsoft**'s Exchange server. *Page 1*

Large corporate users migrating to Novell's NetWare 4.1 are upping the ante and driving hard deals with Novell for greater discounts and extended service and support. *Page 1.* But midsize businesses with hundreds — not thousands — of users lack the leverage of their larger counterparts. *Page 12*

BankAmerica plans to exit the institutional trust business, citing the high cost of information technology required by the business. Analysts say the move may be the first time a major bank has opted out of a multibillion-dollar market rather than invest in the computer systems necessary to compete within it. *Page 1*

Less-than-stellar results from a major re-engineering initiative at US West have prompted an overhaul of the company's 5,000-person IS group. The initiative, which cost US West $290 million in 1994, includes the consolidation of customer service operations. *Page 6*

Development tools for Windows 95 applications have been slow out of the gate. Only a few tools have appeared to help developers create applications for **Microsoft**'s Windows 95. However, some developers are anxious for Microsoft to roll out a more complete version of its Microsoft Foundation Class libraries for building 32-bit applications. *Page 81*

From the floor of the exchanges. A joint application development project between the **Chicago Mercantile Exchange** and the **New York Mercantile Exchange** has widened a rift between CME and the **Chicago Board of Trade**. *Page 28.* The **New York Stock Exchange** adds a layer of Unix servers and X Windows terminals between its mainframes and users. *Page 53*

Information is power, and information politics is the art of achieving and maintaining power. As IS organizations move away from a traditional hierarchical structure, corporations must rethink the politics of information management. In "Governance, The New IS Agenda," Paul A. Strassmann launches *Computerworld*'s monthly Leadership Series. This special insert follows page 56.



The 5th Wave *by* Rich Tennant



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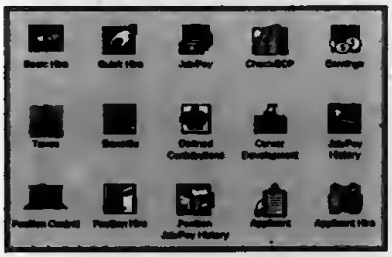


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PC servers bulk up

Enhancements fuel push into minicomputer arena

By Jaikumar Vijayan

PC servers are getting a lot more muscle-bound these days. But they are getting much smarter, too.

Between now and the Networld/Interop '95 show, slated for the last week in March, users can expect to see a spate of server announcements designed to push PC server architectures much deeper into the enterprise.

While considerable gaps still exist between PC servers and traditional minicomputer-class servers — especially in areas such as database management, transaction processing, systems management and communications — the performance delta could be rapidly narrowing, analysts said.

Specifically, the new products are expected to create an emerging class of PC servers, offering much improved price/performance, reliability and manageability, that will be positioned as aggressively priced alternatives to low-end minicomputers.



Power combo

Vendors such as IBM, Compaq Computer Corp., Hewlett-Packard Co., Digital Equipment Corp. and Dell Computer Corp. are readying products that feature multiprocessor technology, error-correcting and checking (ECC) memory, Peripheral Component Interconnect (PCI) bus technology and hot-pluggable drives. The systems will also feature high-performance storage and retrieval options, including RAID, hardware redundancy and disk mirroring as well as sophisticated desktop and network management capabilities.

"If you look at each of these [hardware features] separately, none of them are really killers. But by wrapping these performance adds with some of the management capabilities that are being delivered" vendors will have an increasingly compelling story to tell information systems managers, said Ted Julian, editor of "The Gray Sheet," an industry newsletter published by International Data Corp. in Framingham, Mass.

As such, these introductions could make a more powerful case for vendors pitching client/server computing by addressing some crucial areas of concern. Prices will be less than $25,000, analysts said.

In comparison, a low-end IBM AS/400 system starts at more than $28,000, but it is richer in terms of storage and communications capabilities.

Features such as high-performance PCI buses, for instance, have significantly eased typical I/O bottlenecks over the network, said James Greene, an analyst at Summit Strategies, Inc. in Boston. Similarly, the new servers will come packed with data integrity and reliability features such as ECC memory, hardware redundancy and enhanced storage and retrieval capabilities that should give corporate IS more confidence in high-end PC servers, analysts said.

"These are features that give users more peace of mind" when considering porting vital applications on PC architectures, Greene said.

Users agreed. "In a mission-critical environment, things like storage capacity, speed of data throughput, backup facilities and an open architecture" are some of the most critical areas that need to be addressed, said Roger Culp, a microsystems analyst at Amica Life Insurance Co. in Lincoln, R.I.

Performance and reliability enhancers such as PCI, ECC memory and systems management tools are therefore becoming vital considerations when moving to client/server architectures, he said.

The new servers will start shipping by the early part of the second quarter. IBM is expected to announce its multiprocessor-enabled, network-ready PC Server 720 series, which will include all of these technologies. The server, which is upgradable to two processors, will hit the market with a price tag of approximately $6,800, according to sources close to the company.

More players

By April, both IBM and HP are expected to have quadprocessor servers on the market for less than $20,000. Direct marketer Dell is expected to announce a quadprocessor server by early in the second quarter.

Meanwhile, superserver vendor NetFrame, Inc. will start shipping its 8000 series, which can be upgraded to nine clustered processors and support separate I/O buses and application servers in addition to the CPU. The line kicks off at about $25,000.

In addition to hardware-based performance boosters, the announcements will feature desktop management capabilities as well as tools and heterogeneous communications capabilities that provide extensions into the Unix world.

Church files lawsuit to keep teachings off-line

By Ellis Booker

Last week, the Church of Scientology failed in its attempt to hold a computer bulletin board service (BBS) provider and an Internet access provider responsible for the public postings of a former Scientologist critical of the church.

A federal judge in San Jose, Calif., refused to grant a preliminary injunction to stop the companies from publishing any material that the church claimed was copyrighted.

The church alleged that former Scientology minister Dennis Erlich illegally posted copyrighted material and revealed the church teachings, which the church said it considers to be "trade secrets." U.S. District Court Judge Ronald Whyte, while refusing to grant the injunction, did agree to a restraining order against Erlich from publishing additional materials. Erlich could not be reached for comment last week.

But one of those named in the church's suit, Netcom On-Line Communication Services, Inc. in San Jose, said the outcome of the case will be significant for Internet providers.

"We as a company believe the involvement of our firm is inapplicable," said Warren Kaplin, executive vice president at Netcom. Tom Klemesrud, a BBS operator in Los Angeles, and Netcom were each served with a complaint and a request for a preliminary injunction on Feb. 14. Whyte denied the requests last Tuesday.

Two other cases have been decided by federal courts on the matter of copyright violations via on-line systems, but both involved BBS operators and not Internet access providers. The court found in both cases that the services had been aware of and actively invited the copyright infringements.

No surprise

Legal experts said the court's decision not to extend liability for Erlich's messages to the access providers was not surprising.

"It looks like the judge did not want to exercise prior restraint against Netcom or the BBS," said Lance Rose, a principal at Lance Rose & Associates in Montclair, N.J.

Shari Steele, director of legal services at the Electronic Frontier Foundation (EFF), a Washington advocacy group, was also not surprised. "I was very pleased; that's the way it should have gone," she said.

A more significant development, Rose said, was the church's apparent success earlier this month in a separate case in Finland. The church succeeded in pressuring Finnish police to force Johan Helsingius, creator of a popular anonymous server, to release the name of a user on the system it believed had stolen a church document.

"We're probably in the early stages of a seesaw battle between the people who want anonymity and the people who want to keep people from being anonymous," Rose said.

"There may be various reasons to be anonymous, but when people want to commit criminal acts or violate property rights, that's not a legitimate reason," said Helena Kobrin, a lawyer representing the church.

In the Erlich case, Kobrin argued that technologies are available to help access providers monitor the actions of their users.

Rose countered it is "perfectly reasonable" for carriers of communications such as Netcom to say they cannot watch over all their traffic.

"That's what we argued," said Randy Rice, a partner at Pillsbury, Madison & Sutro, the San Jose law firm representing Netcom. He said that being alerted to Erlich's presence on Netcom "doesn't tell us whether he is violating their copyright" and that monitoring every upload would be "an impossible burden."

Rice said Netcom intended to file a motion to dismiss the case on or before March 16.

Censor-y perception

A proposed law is drawing opposition from those who say it will have a chilling effect on the open flow of on-line information and extend Federal Communications Commission regulation over new technologies, including computer networks.

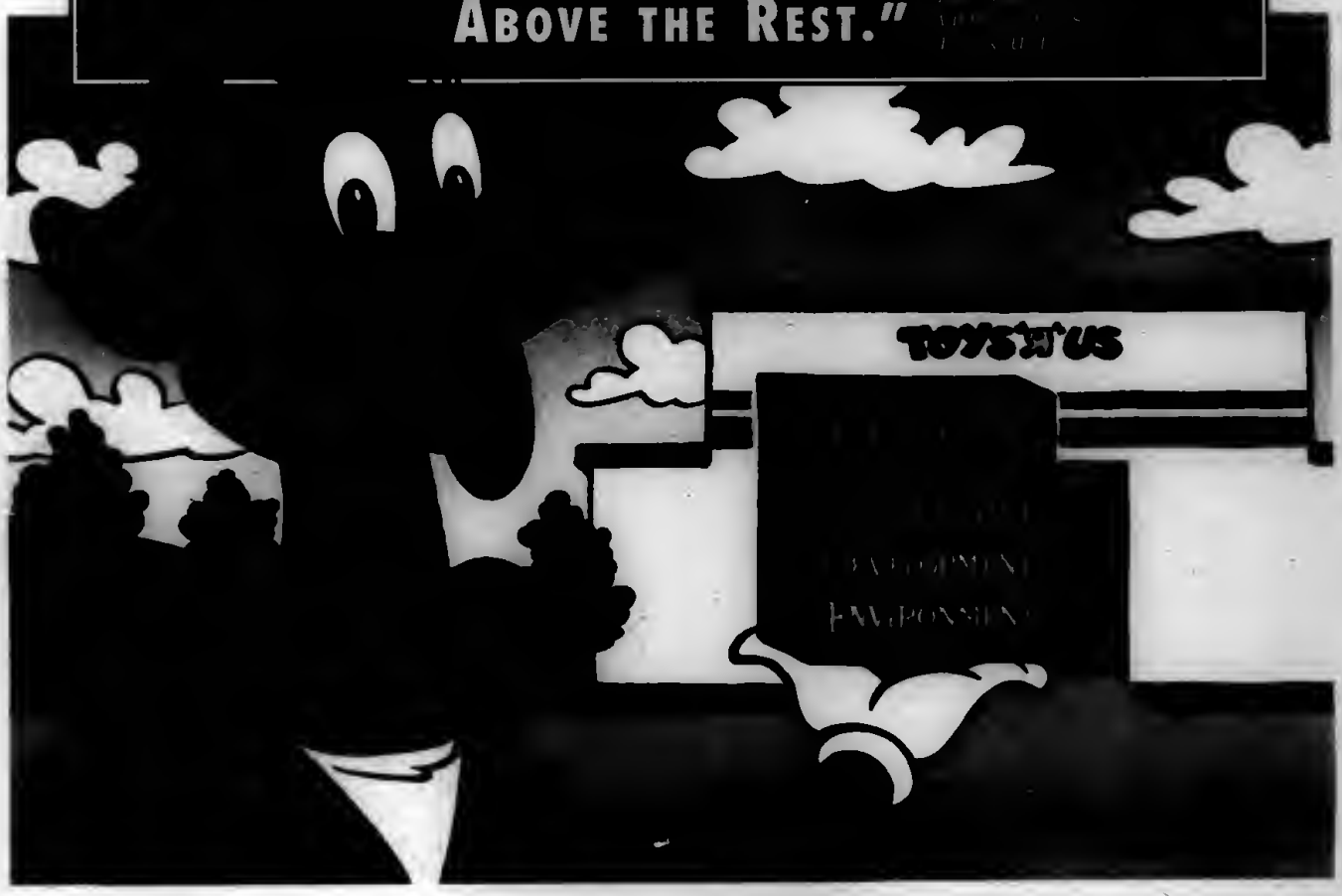
Proponents of the Communications Decency Act of 1995 say it would simply extend laws against obscene and harassing phone calls. But others counter that the legislation, introduced Feb. 2 by Sen. James Exon (D-Neb.), would force access providers to become censors or face $100,000 fines and possible two-year jail terms.

"We should hold wrongdoers responsible and not shoot the postman or turn him into a censor," said David R. Johnson, chairman and senior policy fellow at the EFF in Washington.

The analogy to obscene phone calls, Johnson said, is wrong because users of on-line networks often come across warnings about the content of the material they may encounter prior to entering some areas.

— Ellis Booker

"ORACLE CDE STOOD HEAD AND SHOULDERS ABOVE THE REST."

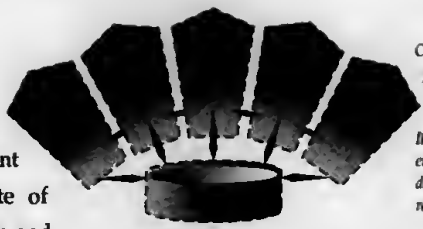


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Sybase boosts Powersoft role

By Kim S. Nash and Rosemary Cafasso
EMERYVILLE, CALIF.

Sybase, Inc. plans to detail a series of enhancements in Powersoft's PowerBuilder in early April to hoist the development tool up to enterprise status, company officials confirmed last week. Sybase is also expected to outline internal organizational changes to allay fears that Powersoft will lose the database independence that helped make it a leader in client/server tools.

On the product side, Sybase's announcements will focus on the Watcom database, a Powersoft product, said Dennis McEvoy, vice president of Sybase's products group. The Watcom database was incorporated into the Powersoft product set following Powersoft's purchase of Watcom in 1993.

New Watcom features will include the following:

- Enterprise SQL Server Manager, the primary utility for managing Sybase's SQL Server database, to recognize, troubleshoot and correct problems with Watcom.
- Replication capabilities to allow databases at different sites to stay synchronized.
- Support for Transact/SQL, the SQL used in Sybase's own database management system.

While Watcom support for Oracle Corp.'s PL/SQL had been rumored, McEvoy declined to comment, but a source at Watcom confirmed that PL/SQL "is being examined."

Still unclear, however, is what road users of APT Workbench, Sybase's character-based development tool, will take. Before the $875 million Powersoft buyout this month, Sybase had promised APT shops a migration tool to help convert APT applications to Sybase's Build Momentum, a partially completed graphical development tool the company had started last year.

Coming soon

• Native drivers to major databases:	Q1 1995
• Sybase database bundled with PowerBuilder tools:	Q2 1995
• Sybase-sponsored PowerBuilder education courses:	Q2 1995
• Distributed features in PowerBuilder:	1995

But Sybase killed Momentum projects after the merger and instead is offering some large APT sites hands-on engineering help in migrating to PowerBuilder, according to two third-party applications makers with major APT investments.

Other APT shops are evaluating a range of tools. Teleport Communications Group, a telephone company in New York, has looked at JYACC, Inc.'s Jam and Neuron Data, Inc.'s Nexpert Object. Teleport was scheduled for a PowerBuilder demonstration late last week, though the meeting was arranged by Sun Microsystems, Inc., not Sybase, said Patrick Socci, vice president of information services. Sun is Teleport's major hardware supplier.

"It seems that Sybase is still trying to sort out what this merger means," Socci said. "The salespeople say they will be able to sell PowerBuilder, but right now they can't," he said. Sybase is reorganizing its sales compensation plan to encourage PowerBuilder deals, McEvoy said. That is expected to be completed by April, he added.

Meanwhile, Sybase's Enterprise Momentum, which would have included a repository for coordinating large-scale client/server development projects, was also shelved. However, the repository will be added to Powersoft's development platform sometime this year, McEvoy said.

A repository is one of the biggest technology boosts PowerBuilder will get from Sybase, said Curt Monash, president of Monash Information Services in New York.

Windows 95 development tools come slowly. See page 81.

PowerBuilder platforms run late

Officials at Powersoft in Concord, Mass., last week revealed that the firm could be several months late in porting PowerBuilder, its Windows-based development toolset, to two other key platforms: the Macintosh and Sun's Solaris.

Instead of shipping the Macintosh version in the first quarter and the Unix version in the second quarter as promised in November, Powersoft now hopes to make these versions available around midyear.

The Macintosh version could now ship in the second quarter, followed by the Solaris version in four to eight months, said Tom Herring, vice president of worldwide marketing. The company needs the extra time to complete additional beta programs before making the products generally available, Herring said.

At least one user who has been anxiously awaiting the Macintosh version, was not pleased last week. John Robison, a software engineer at TravelNet, Inc. in Sunnyvale, Calif., said his company has a project pending that requires a Macintosh toolset. If Powersoft does not come through soon, the company may not for another product, he said.

Herring said the porting projects are taking longer than expected because of the complexities of the PowerBuilder platform as well as Powersoft's approach.

Instead of writing separate code bases, which would ultimately be too time-consuming, it is keeping Windows as the native application programming interface for PowerBuilder and then mapping calls to other environments.

— Rosemary Cafasso

US West's failed restructuring spells IS overhaul

By Julia King

Frustration over a slow-moving, multimillion-dollar customer service re-engineering project has prompted the departure of several top information systems executives and a complete overhaul of US West, Inc.'s 5,000-person IS organization.

Last week, a company spokesman confirmed that the telecommunications carrier spent $290 million on the project last year, but re-engineering "was not proceeding as fast or as well as we had anticipated."

He also confirmed the departure of Will Smith, former president of Denver-based US West Technologies, the $11 billion telecommunications company's now-defunct IS subsidiary.

Also gone from the company are Lloyd Linnell, vice president of billing and corporate systems; Ed Fontenot, vice president of network systems engineering; and Bob Factor, vice president of enterprise architecture and corporate systems.

US West would not say whether the departures were voluntary.

Reworking groups

Under the restructuring, the former information technology services group and an information application development group will become part of US West Communications, the company's main telecommunications services business.

US West Advanced Technologies, the company's research and development arm, will remain a stand-alone unit headed by Bud Wonsiewicz, who was named to replace Smith.

Announced in 1993, US West's re-engineering initiative calls for consolidating 530 customer service offices in 14 states into 26 customer service, repair and maintenance "megacenters" in 10 cities. So far, nine centers have been opened, with the remainder scheduled for completion by the end of 1996.

Falling short

Overly ambitious project completion estimates on the part of IS account for many of the project shortfalls, according to Dennis Dempsey, vice president of information application development.

What has proved especially problematic is an X Windows-based system of intelligent workstations and servers, he said.

"That is one of the systems that got out to centers before we fully understood what it would take to support it. We had significant stability issues in that environment, which has aggravated some of the service problems," Dempsey said.

Runaway costs are another thorn, he added. "Our run rates for the budget in 1994 going into 1995 are too high," he said. As a result, US West plans to lay off 450 IS employees and 400 of 1,000 contractors within the next 30 days, he said.

An unprecedented increase in demand for telephone service has also worked against the company, according to Jane Evans, vice president and general manager of US West Communications' Home and Personal Services Division.

Pieces of US West's re-engineering project

- Consolidation of 530 customer service locations into 26 service megacenters
- Elimination of 9,000 jobs between 1993 and 1996
- Implementation of client/server-based information systems that enable one-stop customer service for new orders, installation, repairs and customized billing options
- Projected project cost: $610 million

"One of the keys to maintaining good customer service is giving our customers the ability to reach our business offices to order service," Evans said earlier this month. "Last year, we failed to meet our customers' expectations on that key measure."

Folding IS into the company's main telecommunications business is one tactic for improving that record, executives said.

As part of the reorganization, Dick O'Keefe will continue as vice president of information technology services, taking charge of the existing systems base and implementation of new systems. Dave Lauhe, vice president/controller and treasurer, has been named acting chief information officer with responsibility for customer service systems developed under the re-engineering project.

Next opens up to Windows

By Kim S. Nash
REDWOOD CITY, CALIF.

Detente between Bill Gates and Steve Jobs it was not, but Next Computer, Inc.'s announcement last week that it will port products to Microsoft Corp.'s Windows NT and forthcoming Windows 95 operating systems brought relief to many Next users.

So did Next's 1994 financial results, which put the company in the black for the first time in its nine-year history (see chart below).

"Windows is a concession the rest of the world has come to, and now Next has reached the same conclusion," said David Smith, an analyst at Gartner Group, Inc. "At this point, they need to capitalize on their momentum," he added, referring to Next's $1 million in profits last year.

Into the black

High sales contributed to Next's first profit ever last year – $1 million

1993		1994	
Direct sales	$10.3M	Direct sales	$25.9M
Services	$ 2.3M	Services	$ 3.8M
OEM sales	$ 1.7M	OEM sales	$ 20.0M
TOTAL SALES	$14.3M	TOTAL SALES	$49.7M

Next's OpenStep object development system will enter beta testing on Windows NT and Windows 95 in the second half of this year, with general availability early next year, said Jobs, Next's president and chief executive officer. OpenStep is an operating system-independent edition of the NextStep object development environment. Next — not Microsoft — will sell OpenStep for Windows.

Deal swayer

The move helped clinch at least two major contracts with large user sites with a penchant for Microsoft products.

For MCI Communications Corp., the promise of Windows support was key to a "sizable" investment the phone company recently made in Next's development tools, said Jim Folk, vice president of information technology at MCI's consumer markets group.

"We're into 'open' here [and] didn't want to run native NextStep," Folk said, referring to the Mach Unix kernel on which NextStep was built. MCI plans to standardize on Windows NT for all its client PCs, he added. Windows 95 is a possibility for MCI's servers, "but it all depends on how fast Microsoft gets it out and Next gets their stuff ported to it," Folk said.

Indeed, Jobs acknowledged that OpenStep engineering work so far has focused on Windows NT because Next has not received a stable beta-test copy of Windows 95.

Next also announced that, once ported to Windows, its Portable Distributed Objects (PDO) messaging framework will let Windows users create objects that can be distributed. PDO is one component of NextStep.

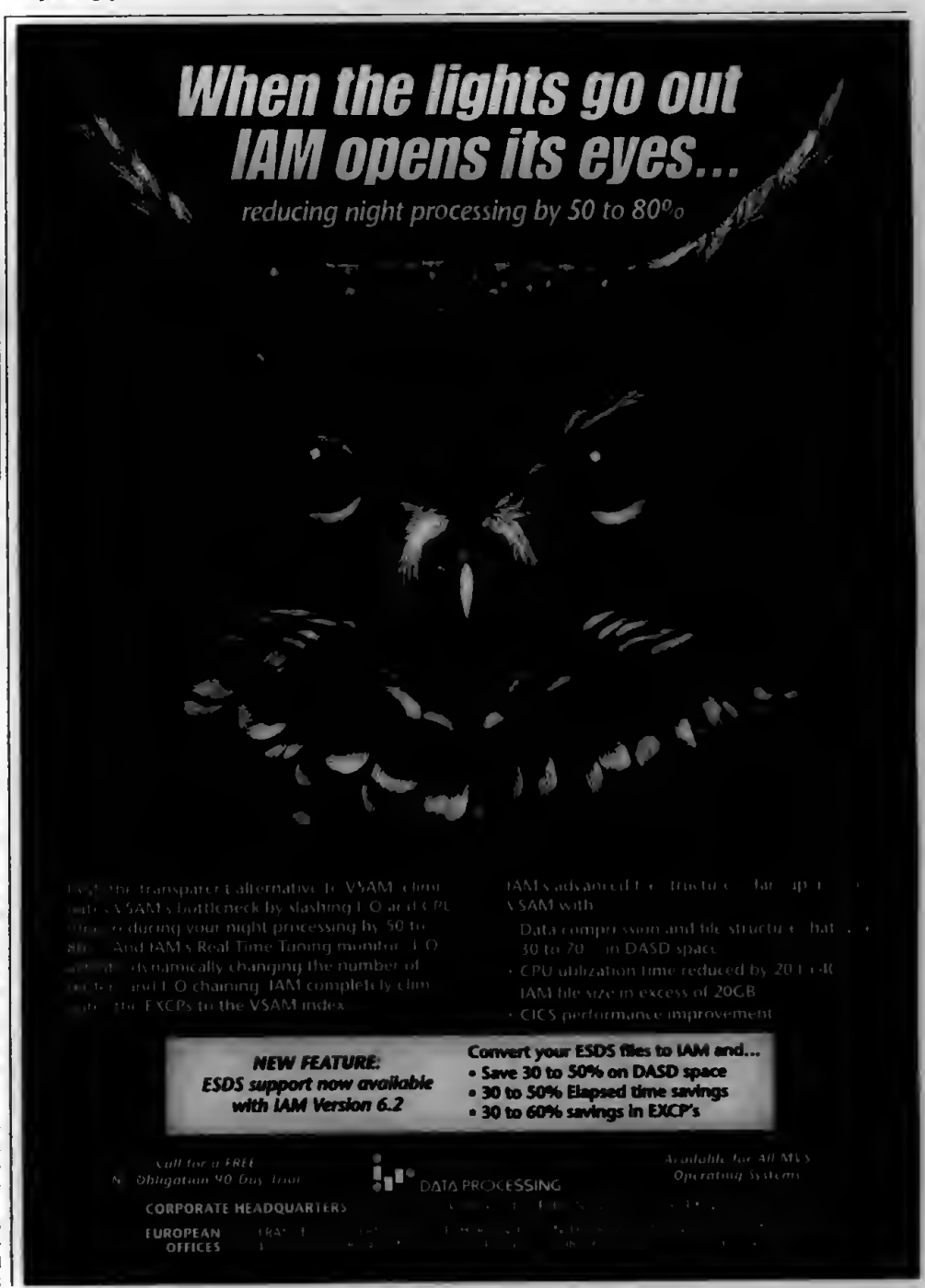
With PDO, users can create the objects for one application. These objects can then talk to and act on objects in other programs running on other clients or servers on the same network regardless of operating system.

The upshot is that Next will offer distributed object capabilities to Windows NT and Windows 95 users at least a year before Microsoft does, Smith said. "Next will be providing a lot more technology than Microsoft has promised so far" for Cairo, its upcoming object-oriented operating system, he said.

Microsoft has not specified a release date for Cairo, but analysts estimate it will be out in late 1996 or early 1997.

In fact, Next is mulling the idea of breaking out the PDO component from OpenStep and shipping a Windows version of PDO "as a booster shot" while the company finishes engineering work on the full OpenStep product ports, Jobs said.

Pricing for OpenStep on the Windows platforms has not yet been set.



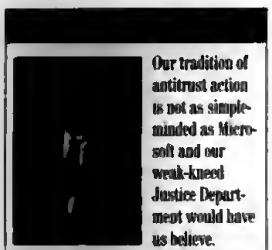
Microsoft gains through monopoly

In an industry that believes in unfettered competition, Microsoft poses a special challenge.

Its monopoly in Intel-based desktop operating systems provides a revenue stream and a level of profit that few can match. At the same time, its dominance grants it a special place in the most dynamically expanding segment of the industry. The Internet shows us that communications and computing are converging. If Microsoft has its way, it will stand at the vortex of this convergence and benefit several times over in selling desktop operating systems, tools, languages, applications, database servers, network access, an on-line service and maybe the content on the network itself.

The question has to be asked: Do we really need Microsoft to do all of these things for us? Doesn't the continued vigor of the U.S. computer industry hinge in some way on how much economic power comes to rest in one pair of hands?

Microsoft protests that it has done nothing wrong in achieving its position. The U.S. Department of Justice largely concurs. But our tradition of antitrust action is not as simpleminded as Microsoft and our weak-kneed Justice Department would have us believe.



Our tradition of antitrust action is not as simpleminded as Microsoft and our weak-kneed Justice Department would have us believe.

Charles Babcock

"The successful competitor, having been urged to compete, must not be turned upon when he wins," wrote Judge Learned Hand of the 2nd Circuit Court of Appeals in *U.S. vs. Aluminium Co. of America* (Alcoa) in 1945.

Microsoft is a successful competitor in operating systems. Through a combination of persistence, technical competence and historical accident, it sells 80% to 85% of Intel-based PC operating systems, and I say let an unrepentant Microsoft continue to compete in this area.

But the dynamic nature of technology is giving Microsoft advantages that would never accrue to a company that merely dominated oil, steel or aluminum. Microsoft's growing economic power doesn't fit our earlier notions of cartels or horizontal monopolies.

Access to the Internet is being built into Windows 95, as is access to Microsoft Network, the company's on-line service. Is it fair competition or restraint of trade if every buyer of an Intel-based PC has these products up and running the first time he boots the operating system? Today, the strength of Microsoft's monopoly in operating systems allows it to keep its prices low in applications and other product areas, and that benefits the consumer. But what happens when revenue is threatened by the slowdown in PC sales that must inevitably occur one day? Will consumers be able to rely on the company's benevolence?

The concentration of economic power in the hands of Microsoft will at some point drive out the diversity and many-pronged experimentation and development that has characterized the industry from its earliest days.

A Microsoft hegemony over key fields of technology growth will depress competition, prevent the emergence of new companies and limit choices. The ties between its operating system engineers and application developers have already given Microsoft undue advantage in application competition. IBM was forced to unbundle the system software from the hardware; Microsoft should be required to redress the implicit bundling of its operating systems and applications. It has exploited the customer's belief that an advantage lies in getting an application from the operating system vendor.

I agree with Judge Hand that business competence has the right to win, but a monopoly position in one field should not become a justification for expanding monopoly powers in many others. As Judge Hand also said in deciding against Alcoa, "No monopolist monopolizes unconscious of what he is doing."

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737

News Shorts

Microsoft discloses acquisition, plans for ODBC 3.0

Microsoft Corp. last week acquired **RenderMorphics Ltd.**, a London-based developer of high-performance three-dimensional graphics programming tools. The Redmond, Wash., software giant will enhance RenderMorphics' Reality Lab product line and integrate it as a general-purpose 3-D application programming interface in future versions of Windows, although it will not be in Windows 95. Separately, Microsoft said the next release of its Open Database Connectivity (ODBC) specification will be 100% compatible with SQL standards being developed by the SQL Access Group and others. ODBC 3.0 is slated for beta release in September, with developer kits to follow in six months. The next release of ODBC will include enhanced database descriptors and extended database descriptors.

Shawmut IS may take the brunt

Fleet Financial Group and **Shawmut National Bank**'s announcement last week that they will merge will mean broad information systems cuts, especially in Shawmut's IS group, banking analysts said. "What Fleet will do now is dislodge a lot of Shawmut's systems because Fleet has the better of the two," predicted Art Gillis, president of Computer Based Solutions in New Orleans. "Fleet is going to reduce costs, get rid of a lot of fat and make a bigger and more efficient bank. It will be a bloodbath for people in the IS arena."



Internet users put on alert

The **Computer Emergency Response Team** at Carnegie Mellon University in Pittsburgh last week sent an alert over the Internet notifying users of a major security hole in most Unix send-mail programs. The problem is in the IDENT functions and could allow a remote intruder to gain access to a system. The response team advised getting the appropriate software patch from the Unix vendor and outlined other possible protections, including turning off the IDENT protocol.

TI combines Pentium, PCI bus

Texas Instruments, Inc. will today introduce TravelMate 5000, the first notebook to combine **Intel Corp.**'s Pentium chip and the Peripheral Component Interconnect (PCI) bus. TravelMate 5000 weighs 6.7 pounds, uses two lithium ion batteries and features serial infrared communications. Prices range from $5,299 to $5,899.

ATM nets get advanced switching

Fore Systems, Inc. in Pittsburgh last week unwrapped software designed to provide Asynchronous Transfer Mode (ATM) networks with the advanced switching capabilities needed to carry all types of network traffic over the wide area. Called ForeThought Bandwidth Manager, it guarantees quality of service for all traffic classes, Fore officials said. The software comes bundled with new network interface modules for Fore's ASX-200 family of TM switches. These modules cost $2,500 per port.

EFF fights restrictions

Calling cryptography vital to the preservation of privacy and security, the **Electronic Frontier Foundation** (EFF) in Washington last week filed a federal lawsuit challenging the constitutionality of laws restricting the export of encryption software and documentation. The suit was brought on behalf of Daniel J. Bernstein, a student at the University of California at Berkeley who wants to publish and export a new encryption algorithm and software that he wrote.

Excel gets query tool

Business Objects, Inc., a database query product maker in Cupertino, Calif., last week unveiled BusinessQuery for Excel. The product was designed to let PC users link the functions of Microsoft's Excel spreadsheet with those of Business Objects' other query and reporting tools without using an interim Object Linking and Embedding layer, the company said. BusinessQuery for Excel will be available to current Business Objects customers in March for $99 and will sell for $350 as a standalone product in the second quarter.

Cray targets commercial users

Cray Research, Inc. last week introduced the next generation of its flagship high-end supercomputers, starting a one-two punch aimed at making its products more appealing to industrial users. The second punch will come in mid-March when Cray doubles its low-end J90 line to 32 processors, sources said. The new high-end T90 has between one and 32 processors and can do up to 60 billion calculations per second. Prices start at $2.5 million.

HP, Legent roll out products

Hewlett-Packard Co. and **Legent Corp.** last week rolled out separate but related products for their systems and network management products. HP will make programming interfaces available to developers who want to integrate their applications with key OpenView components, beginning now with the OperationsCenter problem management software. For its part, Legent is integrating third-party applications into its Prevail/XP products to allow Prevail to manage Novell, Inc. NetWare servers.



SHORT TAKES Sheri Anderson, formerly an IS senior vice president at **Charles Schwab & Co.** in San Francisco, is now chief information officer at **Non-Stop Logistics Corp.**, also in the Bay area.... IBM last week announced an OS/2 Warp upgrade that combines OS/2 with Windows 3.1 support. This is what IBM calls the "full pack" release, and it is available now. ... Former U.S. Congressman Jack Kemp has joined **Oracle**'s board of directors.... David Packard, **Hewlett-Packard** co-founder, is penning his first book — an account of HP's founding and history, to be published in May.

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Many query tools too complex for users' abilities

By Thomas Hoffman
JERSEY CITY, N.J.

A group of information systems staffers said last week that many ad hoc query tools — intended to allow end users to generate reports and manipulate corporate data on their own — need to be simplified to meet that purpose.

"There really aren't any ad hoc query tools that you can just hand to users," said Nicholas J. Donatone, president of the New Jersey Oracle Users Group. "[Users] still have to have some understanding of Boolean logic."

On the other hand, he and other users said, many of the market-leading packages — such as Crystal Reports for Windows from Vancouver, B.C.-based Crystal Services and Intelligent Query from IQ Software Corp. in Norcross, Ga. — are making significant strides in their report-generation capabilities. For example, IQ Software has optimized native application programming interface calls for SQL databases with its Intelligent Query for Windows 4.0 package.

Donatone's group cosponsored "The Ad Hoc Query Shoot-Out" conference here last week, along with the New York Oracle Users Group and its International Ad Hoc Query special interest group (SIG). The conference was an opportunity for 200 IS staffers to lob questions at 10 ad hoc query tool vendors about their products and future directions. For example, most tools require IS staffers to set up a layer of "meta data" against which end users can query.

What to ask when looking for an ad hoc query tool:

- *Does it run on your organization's platform?*
- *Will it run in your database environment?*
- *Where does the query go?*
- *Can you abort a query?*
- *Can you batch a query?*
- *How easy is it to use and create meta data?*
- *Can you "drill down" without a re-query?*

Source: Paul R. Dorsey, professor, computer information systems, Rider University, Warrensville, N.J.

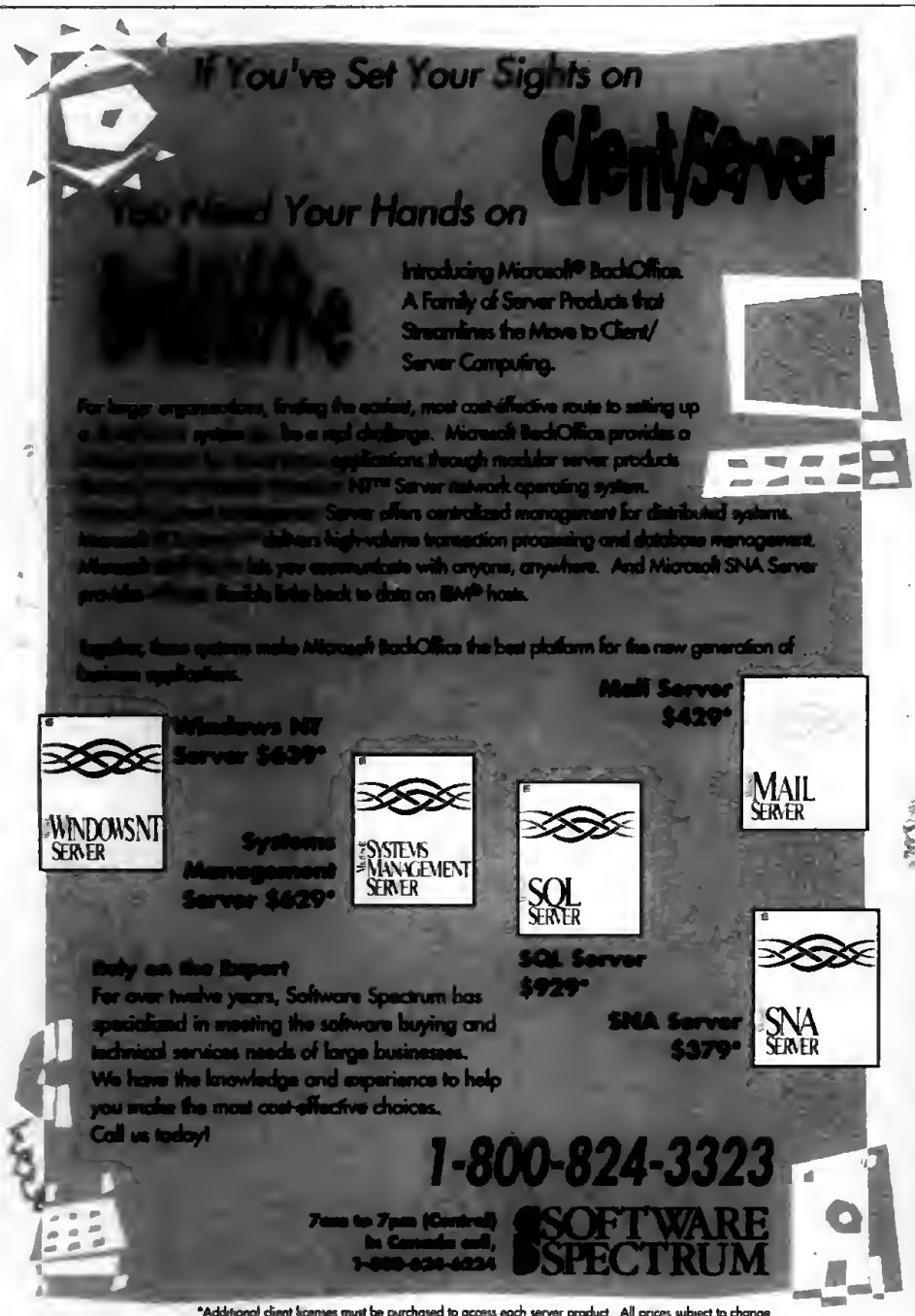
Of the money spent on any given production system, some 10% to 20% is for ad hoc query development and training, according to Paul R. Dorsey, president of the Ad Hoc Query SIG for the New York Oracle Users Group and a professor of computer IS at Rider University in Warrensville, N.J.

Query questionnaire

One tip for IS staffers considering ad hoc query tools: send a questionnaire to users asking them to denote all queries they are likely to make. This helps organizations better define a data warehouse scheme, according to Paul Dorsey, professor of computer IS at Rider University.

"I'm looking for a mix of low meta layer work and an easy user interface," said Ann Radcliffe, an application manager at Ryland Mortgage Co. in Columbia, Md. She is in the early stages of searching for an appropriate query tool for her company's end users to launch against an Oracle Corp. data warehouse. "We can't have our entire MIS staff spending their time working on meta layers," Radcliffe said.

Some vendors said they are trying to address this. Oracle, for example, said it spent one-third of its development time for Oracle Data Query 4.0 simplifying the interface to the meta layer, according to Phillip Slater, a senior product manager at the Redwood Shores, Calif., database purveyor. The interface is expected to reduce the amount of time IS staffers will have to spend administering the meta layer, Slater said. The product is scheduled to ship in April.





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Novell

CONTINUED FROM PAGE 1

system and internetworking environments, beta copies of all Windows NT BackOffice products and big discounts.

Chevron Information has some 22,000 NetWare users on 450 NetWare 3.12 servers worldwide and about 25 newly installed Windows NT 3.5 servers. The firm is about to migrate to NetWare 4.1 and has scheduled an executive briefing with Novell next month to address several areas of concern, including declining support and pricing, Lisiak said.

"Novell has gotten arrogant. Maybe they don't think that Chevron, a Fortune 10 company, is big enough for them. But it's time we gave them a jolt," Lisiak said. "If we were 100% NetWare with no plans to move to NT, we wouldn't have this type of leverage."

Not everyone is disgruntled

Tom Pesut, Novell's senior vice president of sales for the Americas in San Jose, Calif., said such reactions were "few and far between." He said, "We work closely with our customers to resolve specific issues in executive briefings."

John Verreault, supervisor of technical services at Hoechst Celanese, Inc., a pharmaceutical and chemical firm in Montreal, agreed. He said his firm, which has 12,000 NetWare nodes at more than 100 locations throughout North America, will also actively pursue better discounts and more flexible payments as it commences its own NetWare 4.1 upgrade.

Verreault noted that Microsoft provides Hoechst Celanese with a discount in excess of 50% off list prices across the board; the discounts on NetWare 3.x have been approximately 40%.

"Each of our sites has been negotiating with local resellers, and we haven't been getting the best deals on price, although Novell has been fair to us on service and support," Verreault said.

"We have no desire to put Novell up against the wall," he continued, "but we would like to see changes, particularly with regard to receiving a more flexible payment schedule, like the one we have with Microsoft."

Currently, Hoechst Celanese reports all new installations of Windows applications to Microsoft every few months and is billed quarterly.

"We'd like the same sort of arrangement with Novell, and we're also going to push for direct service and support from Novell as we negotiate our [master license] agreement," Verreault said.

Hoechst Celanese and Chevron are not alone in their quest for better deals, said Howard Lubert, president of Hel Custom Software, Inc. in Wayne, Pa., a Novell Platinum reseller. "We're beginning to see a lot of users realizing their newfound strength and actively pushing for better deals."

Many customers feel like Steve Austin, MIS director at Helicopter Support, Inc. in Orange, Conn.: The more competition there is, the better it is for users overall.

As it turns out, these days Novell is willing to be accommodating, according to users, resellers and consultants.

John Powers, president of Powers & Co., a network consulting firm in Tewksbury, Mass., said Novell will respond quickly to "the looming shadow of Windows NT Server 3.5."

"I expect that the rubber will meet the road this October, which is traditionally when users make their purchasing decisions for the following year. Users can reasonably expect Novell to initiate additional 20% discounts on top of existing discounts for NetWare purchases and maintenance deals," Powers said.

Reed Quots, supervisor of desktop and network services at the Millstone Nuclear Power Station in Waterford, Conn., reported that his firm has already succeeded in driving down the price. It is also getting better on-site technical support after agreeing to buy a set amount of Novell products in the next two years.

3.1 users won't rush to upgrade

While Fortune 1,000 firms flex their corporate muscles to get better deals from Novell, mid-size firms with hundreds — not thousands — of NetWare 3.x users are wrestling with many of the same concerns but lack the leverage of their larger counterparts.

Some of these users, who represent a large block of the installed base, are in no hurry to migrate to NetWare 4.1.

"I've been keeping my head down on the issue of migrating [to 4.1]. I'm still very happy with NetWare 3.12," said Fred DeCosta, network administrator at Delta Dental Health Insurance Corp. in Boston. "There aren't a whole lot of reasons to upgrade, and I still have some concerns about NetWare Directory Services. I'm also confused about Novell's direction and whether or not they want my level of business."

Bill Wade, IS manager at Oxbow Corp. in West Palm Beach, Fla., agreed. "We're in no rush to upgrade to 4.1," he said.

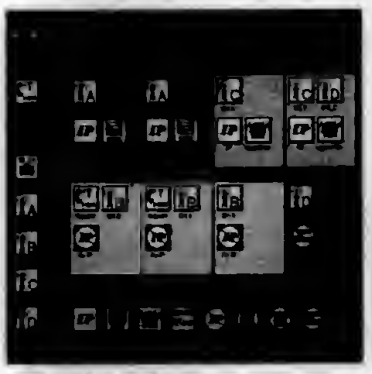
John Livengood, senior network specialist at Easel Corp. in Burlington, Mass., said Novell has offered his firm incentives to upgrade its 150 users to NetWare 4.1. He said he expects the company to do so within the year but is more interested in Novell articulating a clear strategy.

"I'm concerned that Novell's vision and long-term strategy are very fuzzy," Livengood said. "The company has been living off its installed base and the large number of available third-party applications for too long. That has to change."—*Laura DiDio*

Bandwidth boosters

Loral switch steps on router territory

By Stephen P. Klett Jr.



Loral's ProSwitch *has an advanced management GUI that lets users alter protocols by pointing and clicking*

Ethernet switches are following in the footsteps of their hub brethren and beginning to incorporate more routing functionality.

As a result, users are finding themselves in the driver's seat, enjoying more intelligent, functional products at lower prices.

In fact, the latest entrant to the switching market, Loral Test & Information Systems in San Diego, will announce an Ethernet switch today that beta users and analysts claim trumps — at least for the moment — the current switch crop in the areas of management and routing functionality.

Loral's eight-port, $6,250 ProSwitch combines the performance of switching with protocol and broadcast filtering features typically reserved for more expensive and complex routers, observers said. The switch also offers an added port for an Internet or wide-area connection.

Protocol support

Users can configure each port on the switch to manage IP, IPX, Digital Equipment Corp.'s DECnet and Apple Computer, Inc.'s AppleTalk traffic and also block unwanted broadcasts within or between protocol groups, Loral officials said. A point-and-click graphical user interface (GUI) eliminates the need to configure router tables via typically more complicated command-line interfaces.

"What sets [Loral] apart and gives them an edge is this sophisticated protocol filtering, which will help the user build firewalls to manage different protocols," said Skip MacAskill, a Gartner Group, Inc. analyst in Amherst, N.H. "The GUI is also really slick and is one of the best and appears to actually live up to the name 'user-friendly.'"

Analysts said they expect other vendors to follow suit with switches that perform various levels of routing.

"Loral does a little bit of routing, and this is what the battleground will be for the next 18 to 24 months — how much routing functionality gets done by switching," said Jim Metzler, an analyst at The Yankee Group in Boston.

With an average price of roughly $60,000, routers are more expensive and complex than most switches. They are also software-based, which results in variable delays in packet transmission due to processing overhead.

"Switches are just the opposite — blazingly fast and simple," Metzler said. "Users want the best of both worlds, and vendors are starting to provide that." Routers are still needed to perform high-level functions, such as protocol conversion, security and subnetting, he added.

According to Loral, the routing capabilities do not result in a performance hit, and the switch is still able to transmit data via a store-and-forward switching methodology at full Ethernet wire speed of 10M bit/sec.

ProSwitch also has a port for connecting a network analysis product such as Network General Corp.'s Sniffer. It can graphically show statistical analysis of data traffic passing through the switch.

Soaring

The switching market reached $330 million last year but is expected to skyrocket to more than $2.3 billion in 1996, according to market research firm Dataquest, Inc. in San Jose, Calif.

Users cheer

These diagnostic and routing capabilities were a hit with beta users.

"The window into the [switch] is a pretty nice tool for creating logical groups without having to think very hard about it — which is the real strength of this switch," said Jim Madden, manager of network operations, academic computing services at the University of California at San Diego.

"The user interface of the ProSwitch will give me an opportunity to measure traffic between nodes, [measure] errors of other types besides collisions and ... performance measurements that were previously unavailable," said Jay Dombrowski, engineering networking systems manager at San Diego Supercomputer Center in California.

The switch is available now. The management software is available in Windows and Unix versions for $500 and $995, respectively.

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X/Open ships test suites

Unix products must comply with Spec 1170 standard

By Jean S. Bozman

The X/Open Co. last week began shipping software-testing suites intended to be the muscle behind the Unix community's attempt to band together to fight Microsoft Corp.

The suites were designed to ensure that vendors licensing the new X/Open Unix brand name comply with the year-old Spec 1170 standard, renamed the Single Unix specification.

But whether the software suites will succeed remains to be seen. Although the testing suites, priced from $15,000 to $40,000, are intended to ensure that all Unix vendors stick to the same set of application programming interfaces, vendors are still free to add different bells and whistles. That will complicate porting software among the various versions of Unix, one of the problems that the X/Open testing suites were supposed to solve, users said.

License fees

X/Open will sell Unix brand-name licenses to operating system vendors. Prices for annual license fees are $25,000 for vendors that sell fewer than 1,000 units; $50,000 for vendors of 1,000 to 30,000 units; and up to $110,000 for vendors of more than 30,000 units each year.

Delayed reaction for users

What direct impact, if any, all this will have on customers is still up in the air. "A lot of this is going on at a layer below what users pay attention to," said Dan Kusnetzky, a Unix analyst at International Data Corp. in Framingham, Mass. "It's going to have an impact on them when they buy or develop software with the idea that it has to be portable."

"It still has to be proved to users, and it has to be real," said Gene Friedman, vice president of applied technology at The Chase Manhattan Bank NA in New York. He said Chase has taken steps of its own by standardizing on Unix System 5 Release 4 for its new Sun Microsystems, Inc. and AT&T Global Information Solutions Unix symmetrical multiprocessing servers. But Friedman said X/Open has yet to address unified application development for Unix platforms.

Users are waiting to see if the new standard will ease day-to-day systems administration. They recall that they have been promised Unix compatibility before.

"We have four different flavors of Unix to support," said Michael Zeitlin, who manages a visual computing group at Texaco, Inc. in Houston. "It's been a pain in the neck." He said he hopes the X/Open standard will lessen the differences among systems.

On the other hand, third-party software vendors, which will be the first to benefit from the unified Unix operating systems, appeared pleased. "It'll reduce the cost and therefore allow more vendors to support Unix cost-effectively," said Alfred Spector, president and chief executive officer of Transarc Corp., an IBM business unit that makes transaction-processing software.

X/Open's test suites prove a base level of Unix compatibility, which should ease the task of porting applications among Unix platforms.

"All along, real Unix was in the eyes of the beholder," said Michael Gouide, a senior consultant at Patricia Seybold Group in Boston. "At least we've got a stake in the ground, a commonly agreed-upon definition of what is Unix." Large user sites may be able to reuse Unix code, he said.

Unix gains a foothold at the New York Stock Exchange. See page 53.

Sun

CONTINUED FROM PAGE 1

grated directories and relational database storage and management tools. Son will support PC and Unix-based mail as well as legacy systems.

Billmaier also revealed that Sun plans to link its enterprise E-mail with older systems, such as Digital Equipment Corp. VAX E-mail and IBM's mainframe-based Professional Office System. In addition, attendees at the presentation said Sun plans to support Lotus Development Corp.'s CC:Mail and Notes, as well as Microsoft Corp.'s Mail.

Billmaier would not say last week whether delivering mission-critical mail would entail a backbone or switch approach. However, industry analysts said that if the company attacks the emerging area of enterprise backbone mail servers, it will be responding to Hewlett-Packard Co.'s OpenMail offering and Microsoft's Exchange server. It is also expected to build on parent Sun Microsystems, Inc.'s broad push into the enterprise server market, where it faces Unix rivals HP and IBM.

The new E-mail technology will incorporate a custom E-mail system called Roam, which was designed for Sun's Voyager portable workstations, said Bob Mitton, a senior product manager for Sun's Voyager SPARCstation, which was enhanced and re-released this week. It is expected to reduce network traffic caused by E-mail downloads from servers.

"It is designed to work on very low bandwidth networks or to use very little bandwidth on your existing networks," Mitton said. "It's set up to be true client/server."

Until now, Sun users have either tapped the Sun-designed MailTool E-mail system that comes bundled with Sun's Solaris operating system or used third-party Unix E-mail systems, such as Network Computing Devices, Inc.'s Z-Mail and the Eudora freeware E-mail software some users download from the Internet.

Mike Prince, MIS director at Burlington Coat Factory Warehouse Corp., said he is expecting a revised and enhanced MailTool software offering to be bundled with Solaris later this year. "I would expect a new MailTool that is part of the [Common Desktop Environment] initiative," he said. "They released Solaris 2.4, but they didn't release the mail tools."

Prince said an enterprise mail server would reinforce Sun's moves into PC integration, although he said he did not know of the mail server plan.

But, according to Ron Rassner, an analyst at Creative Networks, Inc., a consultancy in Palo Alto, Calif., Sun — a late entrant — must do three things to compete effectively and get a leg or two up on HP:

- Combine the communication environment, which is messaging-based, with the information environment, which is populated with databases. "HP is not doing this," Rassner said.
- Provide the 1993 X.500-based directory services, which HP does not yet have.
- Provide a natively written backbone similar to HP's.

Intersolv delivers configuration tool with Windows interface

By Elizabeth Heichler

A new release of Intersolv, Inc.'s PVCS Version Manager software configuration management system is slated to be launched today. Between that and a lengthening list of vendors supporting the product, Intersolv is maintaining its momentum in multiplatform client/server environments, according to analysts.

"Intersolv clearly is ahead as far as installed base," said Ed Acly, director of software research at International Data Corp. in Framingham, Mass. "And when a vendor gets a wide installed base, the momentum swings toward them."

Researchers at Gartner Group, Inc. and Meta Group, Inc. agree that Intersolv is the dominant player in this market.

Vital to the Rockville, Md., company's success has been a bottom-up approach to configuration management, which features direct links with a wide range of development tools, Acly said.

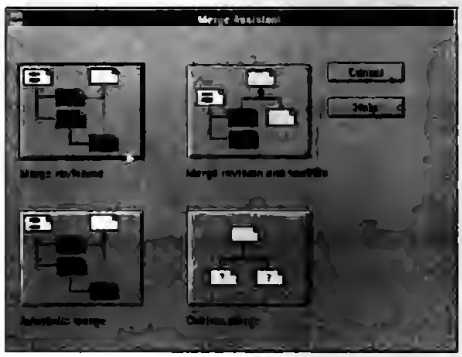
This contrasts with the approach of competitors such as Softool Corp. in Goleta, Calif., and Atria Software, Inc. in Natick, Mass. Both offer what Acly calls "big footprint, top-down strategy, all-encompassing solutions." In other words, rather than bring in multiple software tools to cover the whole development environment from the outset, people are more likely to solve problems as they arise, one piece at a time.

Windows interface wins raves

Version 5.2 of PVCS is the first edition to implement a truly easy-to-use Windows 3.1 user interface, said beta tester Lan Barnes, principal at Icon Consulting, Inc. in Baltimore. He uses PVCS 5.2 at a large New York financial institution.

With Version 5.2, Barnes said he can now restrict the menus people see by user category, and he can set up as many user categories as he wants. While Barnes said he usually prefers using a command-line interface, "it's worth getting Windows to get control of 5.2."

More than 50 development tools vendors now offer integrated access to PVCS, including it that announced support this month. Intersolv's competitors generally link to development tools through open application programming interfaces, a method Acly said provides a level of integration that is not as tight. These most recent supporters include Information Builders, Inc., Informix Software, Inc., Novadigm, Inc., Progress Software Corp., Software AG of North America, Inc. and Unify Corp.



PVCS Version Manager 5.2 *can now step users through complex version management tasks such as merging files*

Ahead of the game

"Intersolv is light-years ahead of anyone else because of the fact that you can use their tool with a variety of languages and development suites," said Jeff Headley, systems architect at First Union National Bank in Charlotte, N.C. His group develops applications using Smalltalk, and he said he likes how PVCS lets him manage traditional procedural code and object code through the same interface.

PVCS Version Manager 5.2 is shipping now and costs $499 per user through April.

Pyramid's parallel system lets users scale up beyond SMP limits

By Craig Stedman

Pyramid Technology Corp. plans this week to jump into the commercial massively parallel market with a long-promised system that later this year will be able to integrate symmetrical multiprocessors with parallel computing nodes.

That capability would let users scale up beyond the size limits of symmetrical multiprocessing (SMP) technology while retaining their existing systems. Customers using SMP boxes for transaction processing could also run decision-support applications within a single overall system. The parallel box will support SMP systems from Pyramid and parent-to-be Siemens Nixdorf Informationssysteme AG, which is due to acquire Pyramid in early March.

IBM is working on a similar capability for configuring RS/6000 SMP nodes within its SP2 parallel processor, but it is not scheduled to deliver that feature until next year. Pyramid expects to support SMP/parallel combinations by late summer, said analysts briefed on the firm's plans.

Steady climb

Worldwide sales of parallel systems costing more than $100,000 for use in commercial decision-support applications should increase from about $600 million in 1994 to $1 billion this year, according to projections by Gartner Group, Inc. in Stamford, Conn.

Pyramid's strategy for the new Reliant RM1000 parallel system is drawing interest from customers who have run into problems with decision support on the Nile and MIServer SMP machines made by the San Jose, Calif., company.

Eluding problems

To avoid performance hits on its six-processor Nile 150, Choice Hotels International, Inc. off-loads reservation data to another system at night before allowing queries, said Gary Thomson, vice president of computer operations and technical support at the Silver Spring, Md., company. As a result, its business analysts run 24 hours behind the times.

"Right now, we can't see what hotel rooms are being sold as quickly as we would like," Thomson said. "We'd like to be able to grab that data out of our reservation system in real time." The Reliant system could make that more feasible, even with the continual need to clean up the data first, he added.

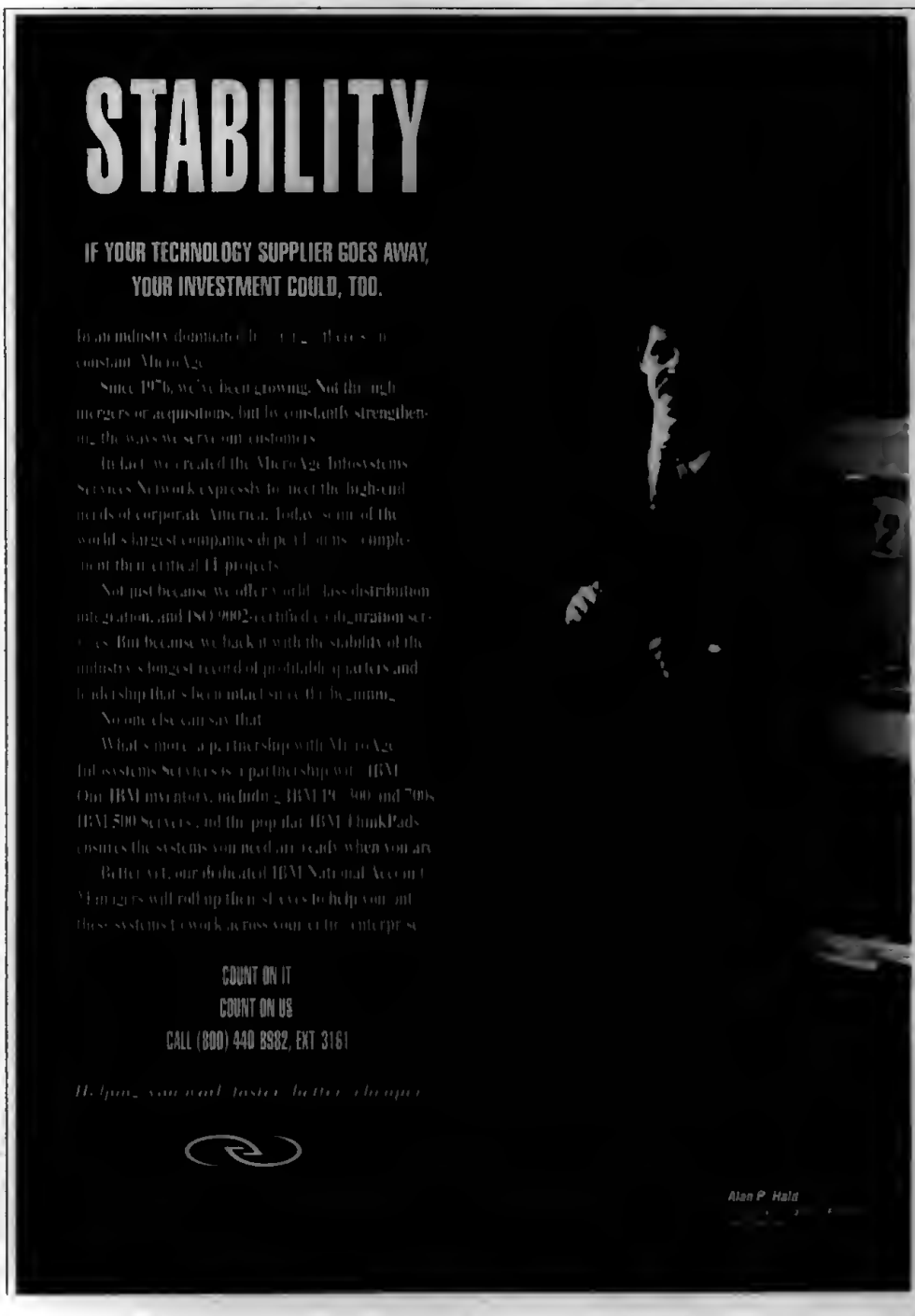
Choice Hotels, which operates about 3,300 hotels worldwide, is in preliminary discussions with Pyramid about the parallel box, Thomson said.

Another Pyramid user, who asked not to be identified, said his shop is doing some querying now and sees a business need to do more. "But we're limited in the overall throughput that we can get" from the Nile and MIServer machines, he said. His firm does not have immediate plans to buy a Reliant system, "but we certainly are interested in taking a look at it," he added.

The Reliant hardware will have the physical capability to connect the Pyramid and Siemens Nixdorf SMP boxes when it ships this week, said Omri Serlin, president of Itom international, Inc., a consulting firm in Los Altos, Calif. But that support will not be added to Pyramid's Unix operating system until another release ships this summer, he added.

Reliant, which had been code-named Meshine for the mesh architecture used to connect processors and memory, theoretically could support up to 4,096 R4400 processors from Mips Technologies, Inc. However, real configurations are likely to top out at 100 to 200 processors, said Rich Partridge, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

The system starts at $200,000 with four processors and is initially supported by Oracle Corp.'s parallel database. By itself, it is targeted mainly at decision-support and video server uses.



Apple, Microsoft barbs stoke feud

CONTINUED FROM PAGE 1

surfaced in a letter sent by Apple general counsel Edward Stead to Sporkin on Feb. 13, one day before the judge rejected the U.S. Department of Justice's proposed settlement of its antitrust investigation of the software giant. The Justice Department and Microsoft have both appealed the ruling.

In the letter, made public last week, Apple also alleged that Microsoft threatened to drop all of its Macintosh development activity unless Apple ceased work on its OpenDoc document management tool. OpenDoc is intended to compete with Microsoft's Object Linking and Embedding (OLE) technology. Gates denied this.

Fighting words

"I am writing . . . to bring to the court's attention certain anticompetitive practices of Microsoft Corp. in its recent dealings with Apple," Stead said in his letter. Recent events, he said, convinced Apple that "without the continuing oversight of the court, Microsoft will not honor the letter or spirit of the final judgment it negotiated with the Department of Justice."

However, Gates took Spindler to task in a "Dear Mike" letter that charged him with reneging on a promise made earlier this month to talk to Gates before suing Microsoft over alleged violations of Apple's copyright of video software called QuickTime. According to Gates, Microsoft sent Windows 95 betas to Apple earlier this month based on that promise, although Apple's letter to Sporkin states that Apple received the code only after it contacted Assistant Attorney General Anne Bingaman about Microsoft. Furthermore, Gates noted, prior to that beta shipment, "Apple had already received a number of [Windows 95] betas."

Separately, Stead's letter to Sporkin accused Gates of withholding Windows 95 beta code from Apple in retaliation for Apple's suit against San Francisco Canyon Co.

Apple sued both Microsoft and Intel three weeks ago in an amendment to an earlier lawsuit Apple filed against QuickTime co-developer Canyon.

"I think it was inappropriate for you to promise to talk to me before filing a lawsuit and then not follow through on that commitment," Gates wrote to Spindler.

Gates also took issue with Apple's claim that Microsoft threatened to halt Macintosh application development if Apple did not pull the plug on OpenDoc.

Stead said Gates made that threat in a Jan. 13 meeting with Spindler. Microsoft developer division Vice President Roger Heinen, who was at that meeting, said, "The question of discontinuing Apple applications was not even on the table."

However, Microsoft stated at the meeting that supporting both OLE and OpenDoc would be difficult, according to Heinen, who said the two companies agreed to "continue talking about OLE and OpenDoc."

Apple dismissed Gates' letter entirely. An Apple spokesman called it "an attempt to rewrite history." She declined to comment on its specific points, saying Apple has covered much of its material in the courts. "We stand by our statements," she said.

No influence

Sporkin indicated the Apple document was not a factor in his decision to reject the antitrust settlement. Technically, the letter has no direct effect on the government's continuing review of Microsoft's pending acquisition of Intuit, Inc., which is a separate proceeding.

However, the steady stream of industry complaints does put more pressure on the Justice Department to take a hard line in the Intuit investigation, antitrust lawyers said.

"More and more vendors are coming out of the woodwork to expose Microsoft's aggressive tactics because they feel even more desperate and frustrated," said Warren Grimes, a law professor at the Southwestern University School of Law in Los Angeles. "But there were serious arguments to be made against the Intuit merger" even before the new revelations.

Last week's cross fire drew mixed industry reaction.

"Obviously, Microsoft plays hardball, but I doubt if they said anything that was a direct threat" in the Apple meeting, said Paul Grayson, chairman and chief executive officer of Richardson, Texas-based Micrografx, Inc. "I don't if either one of them would be under any [legal] obligation to provide the other with information on their operating systems."

"It'd be like General Motors and Ford [being obligated to give each other information on their new cars]," Grayson added.

Speedy justice

The U.S. Court of Appeals in Washington last week approved the government's plea for an expedited review of U.S. District Court Judge Stanley Sporkin's decision to reject the Microsoft consent decree. All briefs will be filed by April 7, leading to oral arguments April 24, the court said. The Justice Department said the speedy review was necessary because the government's process of negotiating consent decrees is jeopardized by Sporkin's effort to reopen the Microsoft investigation.

Taking off the gloves

The roaring debate over whether Microsoft engages in unfair practices reached a fever pitch last week with the release of dueling letters between Apple and Microsoft — each accusing the other of being less than aboveboard. What follows are some excerpts of letters from Microsoft Chairman Bill Gates to Apple CEO Michael Spindler and from Edward Stead, Apple's general counsel, to Judge Stanley Sporkin:

Gates' letter to Spindler: Microsoft

"Apple has come a long way from the original evangelization days of the Macintosh to be using legal intimidation . . . to influence software developers."

"I think it was inappropriate for you to promise to talk to me before filing a lawsuit and then not follow through on that commitment."

"In this [Feb. 13] letter, Mr. Stead alleges that during our Jan. 13 meeting we threatened to discontinue our Macintosh software if you continued to develop OpenDoc. This is also not true. Our whole message . . . was about our commitment to the Macintosh."

Stead's letter to Judge Sporkin: Apple

". . . At the meeting [with Spindler], Mr. Gates stated that Microsoft's withholding of the beta code was 'cause and effect': Since Apple sued Canyon, Mr. Gates personally decided that Microsoft would not deliver the beta of Windows 95 to the Cross-Platform Group."

". . . Mr. Gates threatened that Microsoft might cease developing application software for the Macintosh platform if Apple continues its development of OpenDoc. . . . Since Microsoft is the largest supplier of software applications for the Macintosh, this threat was a serious one."

"Microsoft's actions are clearly aimed at forcing Apple to abandon intellectual property rights that Apple obtained through its own development efforts. . . . Microsoft's threats of withholding beta code and discontinuing the development of Macintosh software applications, if carried out, would be commercially devastating."

Time doesn't heal all wounds

Apple's bullying charges against Microsoft struck a strong chord with former Apple Products Division President Jean-Louis Gasse last week.

Gasse, who now runs his own Menlo Park, Calif.-based multimedia company called Be, Inc., claimed to have "firsthand evidence that Mr. Gates does resort to bullying tactics very often. He makes threats that are not so veiled, so he's a bully. I have no knowledge of the alleged threat in the news today, but it's very consistent with my own firsthand experience."

Gasse claimed that 10 years ago, Microsoft Chairman Bill Gates "bullied" Apple into licensing the Macintosh user interface to Microsoft. That licensing contract became the subject of a long-running and ultimately unsuccessful copyright suit filed by Apple against Microsoft. The U.S. Supreme Court last week declined to hear Apple's appeal.

At the time, Gasse said, Gates threatened to halt Macintosh application development — the same pressure Apple now alleges Gates is using to force Apple to cease OpenDoc development.

"I've seen Mr. Sculley shake after a telephone conversation with Mr. Gates," claimed Gasse, referring to former Apple Chairman John Sculley. "Mr. Sculley and Mr. Eisenstadt [Apple's former general counsel] buckled under and licensed the Mac user interface to Microsoft," he said.

Both Sculley's secretary and his wife, in separate interviews, said he would not comment.

A Microsoft spokeswoman countered that Gasse was conveniently ignoring other earlier incidents in Apple's relationship. For one, Apple founder Steve Jobs had given Gates a verbal promise that he would bundle Microsoft applications with the Macintosh if only Gates would develop them — a promise that Jobs went back on just before the Macintosh was introduced, she said.

"It's well-established in the record; there was no threat," an outraged Gates said. "That [1985] meeting has been described on the public record to the nth detail. Gasse wasn't there. Now, 10 years after that meeting, we're digging that thing up by a guy who didn't participate, and we're trying to overwrite the sworn depositions of everybody who was in the meeting?" Gasse did not like the deal, but he was not present, Gates added.

— Mark Halper, Stuart J. Johnston

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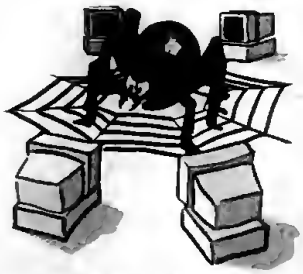
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Security risks lurk on the Web



By Gary H. Anthes
SAN DIEGO

The World-Wide Web has been called the "killer application of the 1990s." With a name like that, one ought to be cautious.

Information security experts at a recent Internet Society symposium here said viruses and other dangers are lurking on the Web, a global hypermedia system whose use is mushrooming.

More companies face exposure as they put up Web servers to display product information. Servers are sometimes set up with little or no security, for example, allowing a customer to download the password file instead of the widget price list.

The Web is a highly distributed client/server system that links information sources and users via a set of communications protocols. The attributes that make it so appealing — ease of use, interoperability among dissimilar environments and an incredibly broad reach — also make the Web a risky place to go.

Also, there is no central point where controls and accountability can be placed. "On the Internet, there is no one to sue when something goes wrong," said Alan M. Schiffman, chief technical officer at Enterprise Integration Technologies, Inc. (EIT) in Menlo Park, Calif.

The foundation of the Web is the HyperText Transport Protocol (HTTP), a connection-oriented and object-oriented set of commands — such as "get" and "textsearch" — that allow Web servers and clients to negotiate with one another.

Two government-sponsored computer incident response teams recently notified users of a major security flaw in the popular version of HTTP developed by the National Center for Supercomputing Applications at the University of Illinois. The flaw would allow an intruder to put rogue code onto a Web server by overrunning a software buffer. That would, in turn, allow the intruder to gain unauthorized access to the account under which the HTTP process was running.

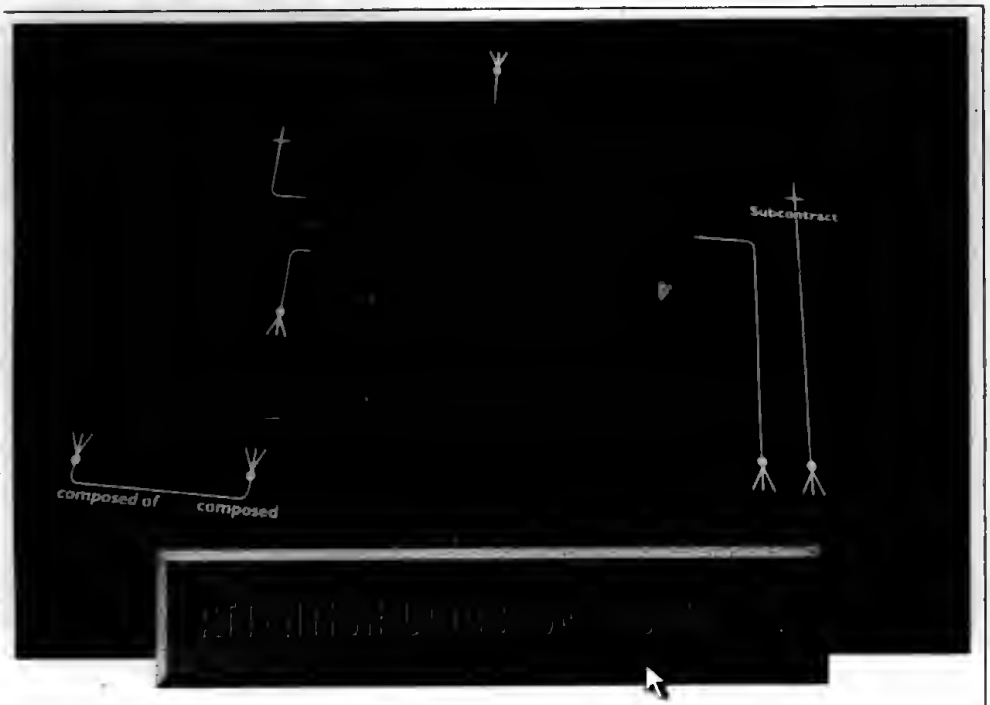
More secure

A promising route to better security for Web users has been taken by EIT, which developed Secure HTTP (SHTTP). It extends the protocol to allow both the client and server to negotiate various levels of security based on encryption. SHTTP is being considered by the Internet Engineering Task Force as an Internet standard and is available now from several vendors.

Netscape Communications Corp. in Mountain View, Calif., licenses an alternative to SHTTP called Secure Sockets Layer (SSL). SSL sits between TCP/IP and HTTP or other services such as Simple Network Management Protocol and provides privacy, authentication and data integrity.

John Pescatore, research director for security services at International Data Corp. Government in Falls Church, Va., advised firms to use one of the new secure products and not to allow the ad hoc establishment of Web servers on the corporate network. He advised setting up servers in "unprivileged" mode, making it harder to access files outside the official Web directory.

The Web software may allow users to bypass security rules built into a "firewall," a special gateway programmed to block certain kinds of traffic between the corporation and the Internet. For example, a firewall set up to block File Transfer Protocol (FTP) services might not recognize an FTP request that has been converted to HTTP by a Web server before it gets to the firewall.



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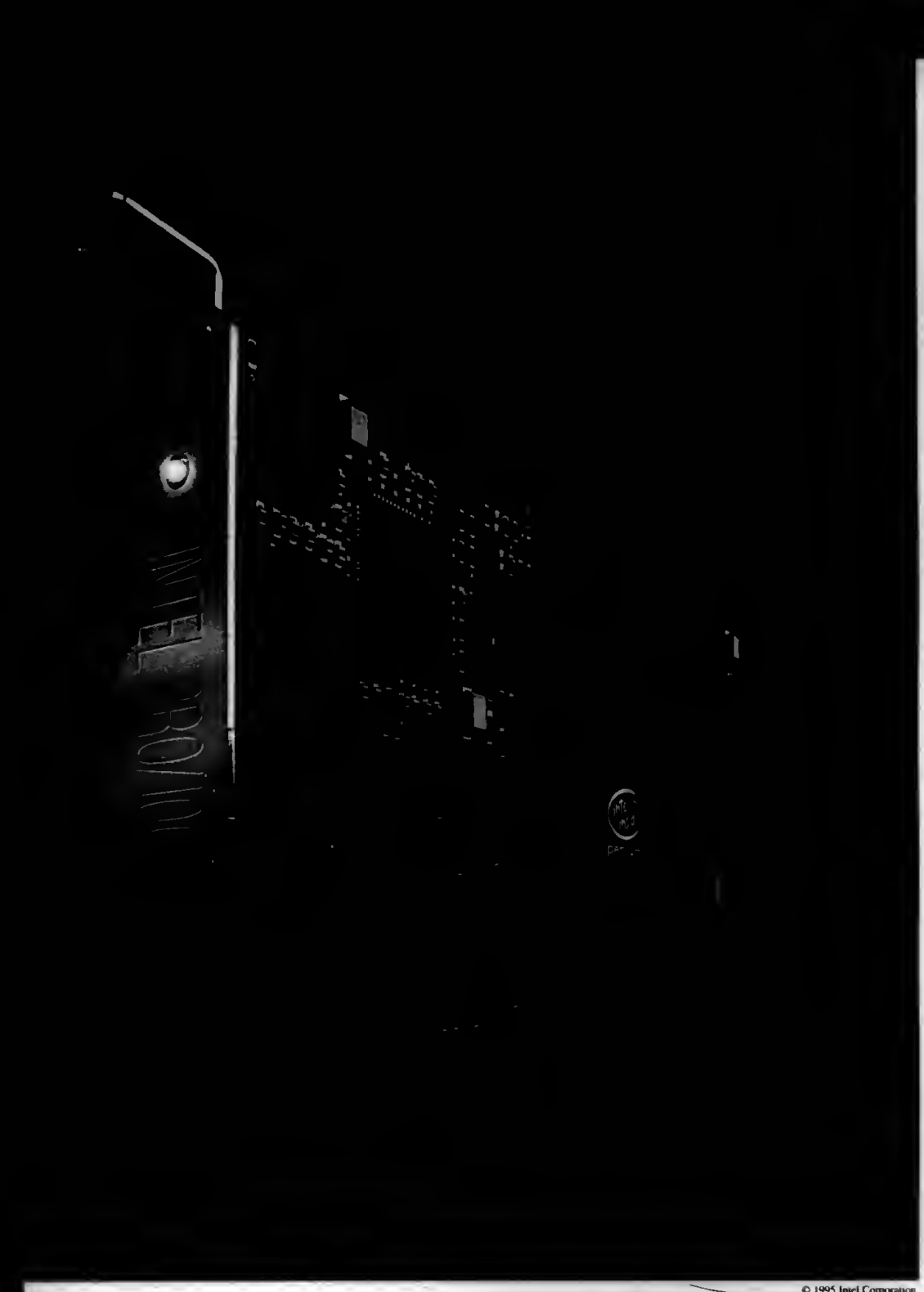
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PeerLogic to integrate Pipes with IBM's DSOM

By Suruchi Mohan

PeerLogic, Inc. sashayed into the world of objects by announcing an agreement with IBM at the recent Software Development Conference held in San Francisco.

PeerLogic, also located in San Francisco, will integrate its Pipes Platform, a distributed communications architecture, with IBM's Distributed System Object Model (DSOM), an object request broker.

DSOM is IBM's implemeotation of the Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA). It supports vendor-independent CORBA, a specification that lets disparate objects communicate with one another.

This partnership is significant for developers who write distributed application software, said Mitch Kramer, a consulting editor at Patricia Seybold Group in Boston. "By using Pipes as a transport, developers will oot have to build drivers for all the protocols on the network," he said. That is because Pipes supports a host of networks, including those based on TCP/IP, IPX and IBM's SNA.

Further, developers will gain a strong communicatioos environment to work on, said Chet Geschickter, vice president of Hurwitz Consulting, Inc. in Watertown, Mass. "For complex system integration, this would be a very good sceoario," he said. One example would be the encapsulation of legacy code in an object and integrating it with Pipes, Geschickter added.

However, it is too early for end users to judge the alliance and its impact, Geschickter said. He suggested that the partnership will mean the most to organizations trying to assess their needs as they move forward with advanced distributed computing.

Faster development

Nathan Dolly, a senior programmer at Blue Cross and Blue Shield of Oregon in Portland, said the announcement broadens the scope of Pipes by letting it work with objects. So far, Dolly has had to manually write pieces of software so the network could pass around similar objects oo different systems, he said. But the process was not smooth.

Free to choose

Chris Stone, president and chief executive officer of OMG, said the agreement with IBM guarantees developers that they will not be locked into Pipes. "Now they can use DSOM and integrate with a variety of transports," he said.

Dolly has not used objects to write software, but given the amount of code he had to write for his network, he estimated that working with objects would have cut his development time in half.

He said IBM's participation will provide him with higher-level tools — which let developers deal with objects as a whole instead of breaking them up and looking at them as bytes — to ease the movement of objects.

"IBM almost comes in as a value-added reseller," Dolly said. The DSOM tools have a lot of built-in features such as security and load balancing. This relieves developers from having to write everything themselves. However, it takes away from the flexibility inherent in writing all the code.

The relationship between PeerLogic and IBM, though symbiotic, means a lot to IBM strategically. IBM has two factors working against it, Geschickter said.

First, Microsoft Corp. in Redmond, Wash., is aggressively promoting its nonexistent distributed Object Linking and Embedding and trying to defeat the other object vendors by gaining mind share.

Second, OMG in Framingham, Mass., has decided not to leverage the Open Software Foundation's Distributed Computing Environment (DCE) services. This means OMG will have to develop its own, which gives Microsoft more time to implant itself in the public psyche.

"The faster IBM can work with distributed objects, the better chance it has of overcoming the handicap," Geschickter said.



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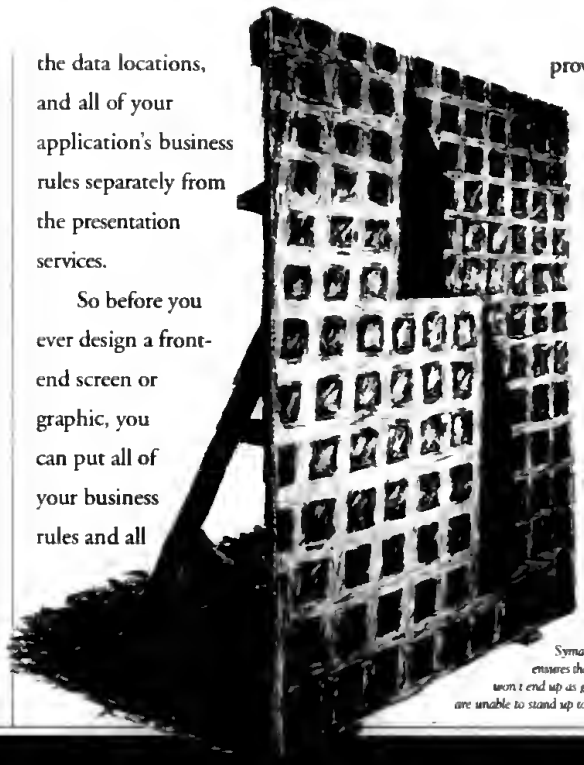
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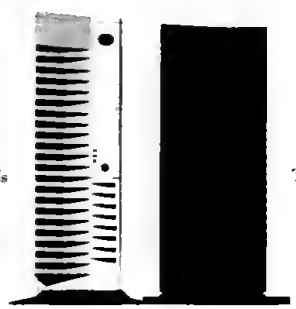
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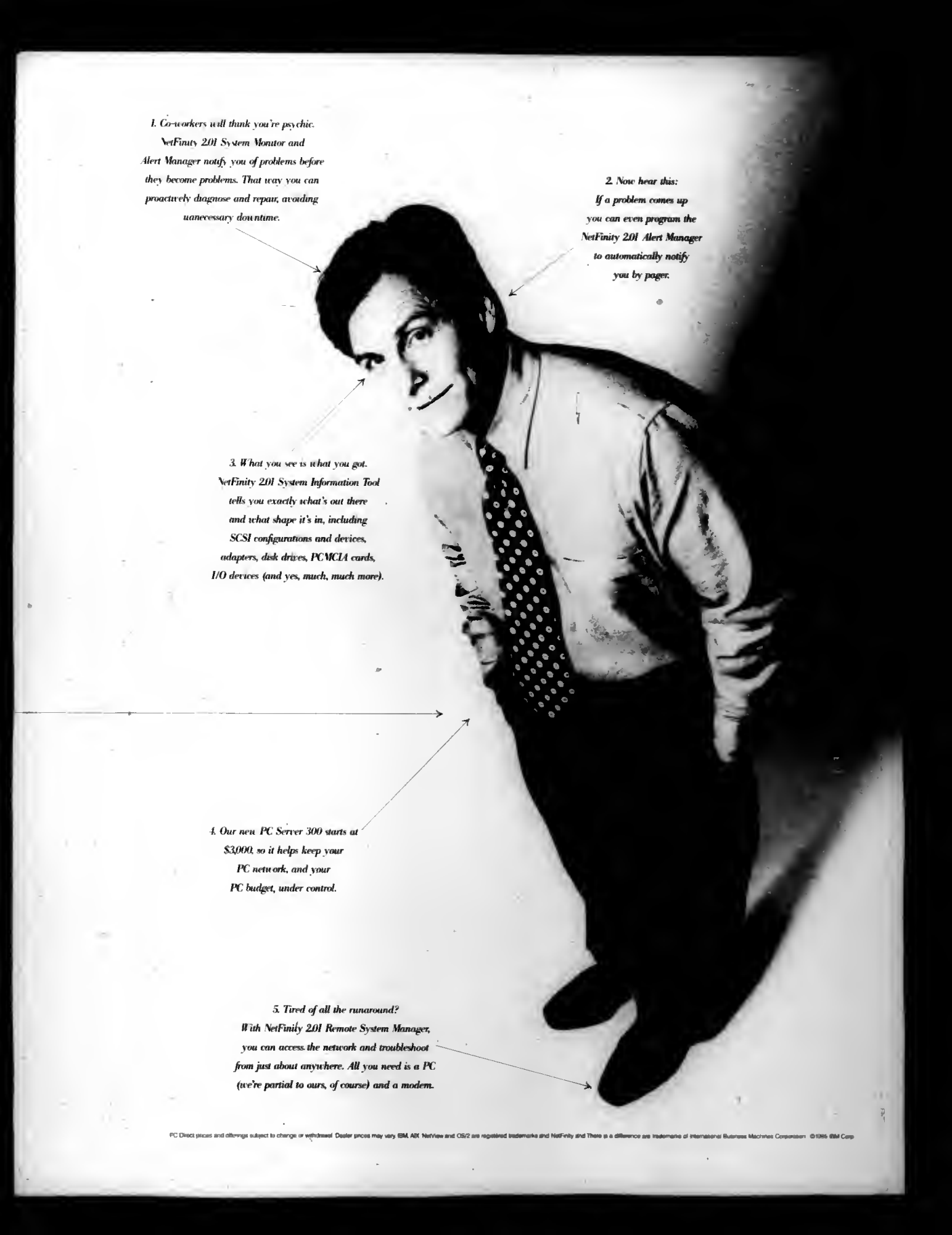
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Chicago exchange gets left behind in development deal

By Thomas Hoffman

Fleet Financial Group's acquisition of Shawmut National Corp., announced last week, is not the only partnership of financial entities that has left a jilted suitor in the lurch.

When the Chicago Mercantile Exchange (CME) and New York Mercantile Exchange (Nymex) agreed to jointly develop standardized, interchangeable trade-clearing applications 17 months ago, it sounded like a win-win situation. It was — for them — but it also led to a widening rift between CME and the Chicago Board of Trade (CBOT). At one time, those two had been negotiating a technology partnership, just as the Bank of Boston was wooing Shawmut before Fleet stepped in.



CME's Ed Gogol: *Clearing 21 gives structure for complex products*

The $20 million-plus CME/Nymex project appears to be on course — the exchanges have significantly reduced their application development costs by leveraging each other's technical and business expertise — but CBOT has been left angered and disconsolate, sources said. That is because back in 1991, CME started a project and talked to CBOT about jointly developing an integrated trade-clearing system and comanaging a single system for all their members, but a joint effort has never got off the ground.

Family feud

As such, the CME/Nymex application development project, called Clearing 21, reportedly has helped widen a rift between CME Chairman Jack Sandner and his CBOT counterpart, Pat Arbor. But spokesmen for the exchanges downplayed reports of hostility. "We have no ill will toward either [CME or Nymex] on their joint project," a CBOT spokesman said.

Sources close to CME and CBOT said the likelihood of future collaborations between the exchanges on a joint clearing system are unlikely because of the Clearing 21 project and other factors. But some interested participants said they are still hopeful the two exchanges can resurrect a technology agreement.

The squabble between CME and CBOT "is a little like 'Family Feud,'" said Jay Finnegan, managing director at Bear, Stearns & Co. in Chicago. "We fight like brothers and sisters here in Chicago, but when the time comes to get things accomplished, we put our differences aside," added Finnegan, who sits on CME's clearinghouse committee.

What it takes

In the meantime, CME and Nymex are progressing on Clearing 21. Last year, the exchanges began using Texas Instruments, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering tool set to create similar applications that can be used on different platforms.

CME, for example, will run the IEF-developed trading and clearing applications on its IBM MVS mainframe, and Nymex will use the applications to process and clear contracts on a Digital Equipment Corp. Alpha OpenVMS platform.

When the work is finished, the 35 joint members will benefit from a single system interface to both trading pits, and their individual members will gain from streamlined trade processing. Executives at both exchanges said they expect most of their trading and clearing applications to be built by year's end, with both systems entering full production in late 1996.

Executives at CME said they anticipate significant but undisclosed cost savings, in addition to streamlined trade clearing for members. Clearing 21 "will give us a structure that will be flexible enough to more easily handle complex products the exchange may wish to trade," said Edward Gogol, director of systems development for CME's clearinghouse.

For Nymex, the biggest benefits of Clearing 21 are "standardized business practices and user interfaces between the two exchanges and their members," said Allen Feryus, senior vice president of information services at Nymex.

IS battles PC overload

Systems bog down under the weight of computer clutter

By Neal Weinberg

A messy desk may be the sign of a brilliant mind, but a cluttered PC can turn into a major headache for information systems managers.

Those same managers probably had high hopes that the recent National Clean Out Your Computer Day would make a big difference.

No such luck it seems.

The problem is that enthusiastic users nationwide are busily adding 32-bit virtual device drivers, rewriting system files, installing their own third-party cards and basically "junking up" their PCs. Once finite storage space is exhausted, the PC typically goes down, and the IS manager has to get it up and running again.

"It's a huge problem," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H. And it has potentially far-reaching implications.

On a network with shared storage space or one that automatically backs up files on the network server, one person's messiness affects everybody, Dunkle said. That is because the system slows downs under the weight of huge amounts of electronic clutter.

Five tips for cleaning out your computer

1. Clean out E-mail in-boxes, the oldest first
2. Set up electronic folders for your key projects and place must-keep messages in folders
3. Act on and delete messages immediately after you read them
4. Transfer files that have not been used in a determined time frame to disk
5. Save old files inherited from predecessors to disk

Source: Institute for Business Technology, Washington

David Reid, a consultant at Strategic Research Corp. in Santa Barbara, Calif., claims that 80% of the data currently residing on office PCs is outdated. And the problem is getting worse as networks get bigger and individual employees do more on their PCs, he said.

"Many companies are running disk drives at near-full capacity all the time," Reid said. A network server can get so clogged up that applications, which need a certain amount of head room, simply fail. When that happens, files can be lost.

User tenacity

Meanwhile, in the battle between the communal rights of the group and the rights of the individual PC user, the IS manager is called to lay down the rules, said Ira Chaleff, president of the Institute for Business Technology, a consulting company in Washington.

To tackle this thankless job, IS managers have a number of tools at their disposal, including software utilities that root out unauthorized or unused applications and ones that automatically purge electronic mail after a certain date.

Mario Soberal, director of technical services at Sun America Financial, Inc. in Los Angeles, said he has seen people with 1,000 E-mail messages stored on PCs — and many are simple one-liners such as "Please send me this file."

In the case of E-mail, the glut tends to gum up the server handling the system, Soberal said. His solution is to politely tell people to sweep out their files, and that usually works.

But it is not always that easy. Some PC users get testy when told to clean out their files, triggering a power struggle between IS managers and pack-rat employees.

John W. Buzard, a communications manager at Citizens National Bank in Evans City, Pa., tries to run a tight ship.

Buzard allows only approved software on PCs. Any other software added to the system automatically calls up a red flag so he can get rid of it.

These days, Buzard finds himself battling with the bank's auditor. "He wants to load anything he wants to load anytime he wants to load it," he said.

"We should be in control," Buzard said. Driving this opinion is the fear that a virus will get into the system via an unauthorized package and wipe out bank records for thousands of people.

Soberal said if he did not monitor the situation "you'd have pack rats keeping everything." And because computer clutter is not visible, it is easy for people to lose sight of the problem, he said.

Tug of war

Dale Schwartz, a lawyer at Troutman Sanders in Atlanta, said people filling their hard drives to capacity is "a constant problem" for IS managers at the 200-lawyer firm.

Schwartz's home PC tends to fill up with software downloaded from the Internet and programs he beta-tests for companies. Without a software utility, he said, it is almost impossible to find the root of orphan files, which are remnants of files that were manually uninstalled.

"Virtually everybody has one foot in the paper world and one foot in the computer world. The sheer volume of the communications they are getting in both worlds is overwhelming," Chaleff said.

He said he knows one person so inundated by E-mail messages that co-workers now resort to walking by and sticking little yellow messages on the side of his computer.

Others resort to different strategies. When Maurice Klein, who does development work for the World Bank in Washington, returns from one of his frequent two-week missions to Africa, he often finds 200 E-mail messages waiting for him.

Klein said he typically scans through his messages, reading some and skipping others. He also relies on an automatic 60-day purge to do the cleaning for him.

Chaleff recommends that people make snap decisions on what to respond to, what to save and what to delete. They need to archive E-mail messages and old programs that are too valuable to kill.

However, Dunkle said people will not store old files until they are confident that they can quickly and easily get to them again.

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Briefs

Spectrum sees loss

Spectrum Information Technologies, Inc. reported a $6.6 million loss on revenue of $14.6 million for its fiscal 1994 third quarter ended Dec. 31, 1994, compared with a $12 million loss on $24.4 million in revenue for the same period in 1993. The Manhasset, N.Y., wireless firm recently closed its Computer Bay unit and filed for bankruptcy protection.

HP posts profit

Hewlett-Packard Co. reported a $602 million profit and $7.3 billion in revenue for its first quarter ended Jan. 31. Profits and revenue for the same period last year were $368 million and $5.7 billion, respectively.

SHORT TAKES IMRS, Inc. has changed its name to **Hyperion Software Corp.** and its NASDAQ ticker symbol to HYSW. The announcement was made last week, at the unveiling of its new Hyperion Financials client/server accounting software.... **Informix Software, Inc.** in Menlo Park, Calif., has sold its Wingz spreadsheet and Hyperscript language tool to London-based **Investment Intelligence Systems Corp.** (IISC). After March 31, IISC will provide support, maintenance and upgrades to existing customers.... **Random Access, Inc.** has purchased **Documatrix Corp.**, a Denver-based designer of document imaging systems.... Robert Steinkrauss, formerly of **Racal-Interlan, Inc.**, has been named president and chief executive officer of **Raptor Systems, Inc.** in Waltham, Mass.... Stockholders approved the merger of **U.S. Robotics, Inc.** and **Megahertz Holding Corp.**, which will become subsidiaries of **U.S. Robotics Corp.** The two companies have been renamed **U.S. Robotics Access Corp.** and **Megahertz Holding, Inc.**.... **Summa Four, Inc.** in Manchester, N.H., has adopted a shareholder rights plan.

SGI acquires 3-D graphics firms

Company targets interactive media market, attempts to beat out Microsoft

By Jean S. Bozman

If not with a steamroller, then with a sharpshooter. That is the management philosophy of Silicon Graphics, Inc., which just acquired two three-dimensional graphics firms in a bid to fend off Microsoft Corp.'s move into the entertainment software sector.

"You've got to fire a lot of rifle shots out there," said SGI President and Chief Operating Officer Tom Jermoluk, referring to the strategy of attacking specific niche markets.

In support of that strategy, SGI recently bet on the markets targeted by Wavefront Technologies, Inc. in Santa Barbara, Calif., and Alias Research, Inc. in Toronto. The $1½ billion SGI paid about $500 million in a stock swap to acquire the two small firms, both of which make 3-D modeling software (see chart). Their technology is used with SGI's graphics software libraries to make animated commercials and feature films.

Some analysts said SGI paid too much for what it got. However, the deal enabled the company to create a new software unit to complement its Silicon Studio subsidiary. The new unit may also help SGI defend its turf against Microsoft, which bought Softimage in Montreal in a $130 million stock transaction last year. Softimage's 2-D and 3-D software already runs on SGI machines, but it is not clear if that software will be ported to Windows NT.

SGI's software stars

Wavefront Technologies, Inc.
Santa Barbara, Calif.
Revenue: $17.8 million
Employees: 150
Products: Composer, Explore

Alias Research, Inc.
Toronto
Revenue: $38.3 million
Employees: 240
Products: PowerAnimator, StudioPaint

Tough climb

SGI is reaching for footholds in the booming markets for interactive media and Internet and entertainment software to help continue its 40% annual growth. To gain access to new markets, it also partners with big firms, including Nintendo Co., Japan's Nippon Telephone and Telegraph and Time-Warner, Inc.'s cable division.

"Silicon Graphics is going after the software side of the business," said Michael Zeitlin, a portfolio manager at Texaco, Inc.'s Integrated Visual Information Technologies Group in Houston, which handles visual computing for scientific applications. "Their hardware helped create what Alias and Wavefront are doing, but the future is in the software business." Increasingly, high-end PCs are running the visual graphics and multimedia packages that previously ran only on high-end Unix workstations and servers, he said.



SGI's Tom Jermoluk *seeks to compete by focusing on select markets*

In fact, Tom Furlong, general manager of SGI's Digital Sight and Sound division, said users can expect the company to create more software packages that will target specific market segments.

"By controlling the tools of Alias and Wavefront, they have a way to ensure that their Mips [Technologies, Inc.]-based platforms enjoy an equal or better set of the new 3-D interactive applications that will come out on PCs," said Hubert Delany, a research director at Gartner Group, Inc.'s high-performance computing group.

By targeting market niches, SGI also avoids head-on collisions with big Unix vendors, such as $5 billion Sun Microsystems, Inc. and $25 billion Hewlett-Packard Co. "They don't want to be a general-purpose company," said David Wu, vice president of research at S. G. Warburg & Co. in New York. "They only want to go after the thing where they have the overwhelming advantage."

AT&T GIS forges ahead with reorganization

By Neal Weinberg

AT&T Global Information Solutions lost the driving force behind its reorganization efforts last month when Chief Executive Officer Jerre L. Stead left to join Legent Corp. However, Stead's interim replacement, William T. O'Shea, has pledged to implement the strategy Stead laid out.

Under the reorganization plan — which seeks to return the former NCR Corp. to profitability — AT&T GIS is shifting from hardware to emphasizing high-margin consulting and systems integration in six specific industries.

Analysts said the plan is a sound one, but it could be tricky to execute because the company must successfully convert salespeople into consultants. Instead of pitching hardware to information systems managers, the consultants now have to offer business services to CEOs, said Wayne Eckerson, senior consultant at Patricia Seybold Group in Boston.



AT&T GIS' William T. O'Shea: *The 'major earth-shaking reorganization is behind us'*

AT&T veteran O'Shea said AT&T GIS has attacked the need to reorient salespeople by creating multidisciplinary teams that work closely with clients in selected industries, primarily retail, telecommunications and banking.

AT&T GIS is succeeding in its traditional strong suits but is running into tougher sledding as it moves into less familiar territory such as large government agencies, Eckerson said.

Another piece of the company's transition involves moving to indirect channels to reduce direct sales costs. O'Shea said AT&T GIS receives only 25% of its revenue through sales channels and that percentage must increase, especially in Europe where the firm depends heavily on its sales force.

The reorganization is just beginning to show results. The last quarter of 1994 produced a $45 million profit, and the company grew 16% last year to reach the $8.5 billion mark in annual revenue. But for the full year, AT&T GIS essentially broke even, and the corporate heads at parent company AT&T are looking for more.

O'Shea attributed most of the revenue growth to hardware, particularly PCs, servers and automated teller machines (ATM). AT&T GIS holds 40% of the worldwide ATM market. According to Eckerson, the low-margin hardware gains are a short-term plus that keep the company in the black while it attempts to build up the consulting end of the business.

Revenue from professional services reached $600 million last year, which was only about 7% of total revenue. The goal is to increase that amount substantially, O'Shea said.

Steve Josselyn, an analyst at International Data Corp. in Framingham, Mass., said that in addition to using its existing sales staff, the company needs to expand its professional services team.

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41 Engineering, Scientific R&D Tech. Management
60 Sys. Integrators/VARs/Consulting Management
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No case

Microsoft's competitors are dancing a little jig this week following U.S. District Court Judge Stanley Sporkin's ruling to deny the consent decree between Microsoft and the Department of Justice. But the industry shouldn't get happy feet too quickly. The judge's ruling won't really change anything because the government doesn't have a case to begin with.

Microsoft is guilty mainly of executing brilliantly on a risky business strategy, and that wasn't illegal last time I checked. Throughout its history the firm has done what any aggressive, ambitious, take-no-prisoners business would do. The fact that it was wildly successful does not make it anti-competitive. It makes it shrewd.



Microsoft was not a monopolist when it tied discounts to microprocessor sales. Nor was it a monopolist when it took the dangerous step of breaking with IBM in 1990. It became successful because it executed well on Windows while IBM botched OS/2. Microsoft was not a monopolist for selling successful operating systems and applications simultaneously. Apple and IBM attempted to do the same in the past. The difference was they failed.

I'm not saying U.S. Assistant Attorney General Anne Bingaman should be lionized for the tepid consent decree the Justice Department reached with Bill Gates. The department made a major error in not taking more seriously the evidence that Microsoft used "vaporware" announcements to freeze the market. But it's too late. Bingaman has made it clear she will reopen the case over her dead body, and Gates has offered to front a few million dollars in legal fees to make sure she doesn't have to. That combination, plus the potential after 1996 for a more business-friendly Republican administration to cancel the whole thing, means this investigation will go nowhere.

Good business sense, smart forecasting and aggressive execution shouldn't be mistaken for predatory practices. Microsoft is certainly guilty of the first three sins. And time has run out on any serious effort to prove it guilty of the fourth.

***

Have you read an article in *Computerworld* in the past year that had an impact on you? Please tell the Computer Press Association about it. It is asking readers to vote for the best stories in the computer press in 1994. We need your help to bring home a "Reader-Chosen Award." Please turn to our announcement on page 73 for a list of suggestions and a postage-paid ballot. After all, our readers are the only judges who really count.



Paul Gillin, *Editor*
Internet: *pgillin@cw.com*



A winning Web formula

The article on Silicon Graphics' Internet authoring system ["SGI unwraps Internet authoring system," CW, Jan. 30] states that "patience and expertise" are required to create HyperText Markup Language (HTML) files for World-Wide Web pages.

Tools that speed the development of HTML files are important but so is an understanding of graphic appeal, quality content, color palettes, database programming and the like.

We've found that it takes a team of art director, writer and Unix expert to achieve the best combination of creativity and quality in effective Web pages.

Cliff Allen
Raleigh, N.C.

Sometimes it's worth the risk

Cliff Reeves and Robert Bismuth's face-off over OpenDoc and OLE/COM ["OpenDoc vs. OLE/COM," CW, Jan. 30] raises a paradox: There are times when it is safer to take a risk than to maintain the status quo.

If Bismuth's wisdom had prevailed over the years, we'd still be using quill pens and abacuses. Yes, OLE/COM is older and safer, but it is also slow and has a very limited growth path.

By the way, I fully enjoy my coffee break while waiting for Word, Access, PowerPoint and Excel to initialize when working with a compound document.

If you want safety and predictability, stick with OLE/COM. If you want to create a competitive advantage, look closely at OpenDoc.

Dan Taylor
Austin, Texas

Sizing up Digital

In "Sizing up the big guys" [CW, Dec. 26/Jan. 2], you gave Digital a C- grade and said users can't fathom Digital's strategy of supporting three operating systems. Evidently you have been wearing blinders for the past year.

Digital's three operating systems strategy is well defined and targeted: continue to support and enhance OpenVMS for those users who continue to use it and migrate to it; provide the industry's best overall Unix operating system, OSF/1; and support Microsoft's Windows NT, all on the Alpha AXP platform. Surely this cannot be any more unclear or confusing than Hewlett-Packard's strategy of supporting HP/UX and NT on its PA-RISC systems and MPE on the HP 3000 series.

It is interesting to note that you damn Digital for following a multiple operating system strategy and damn Sun Microsystems for *not* following a multiple operating systems strategy. Come on folks, you can't have it both ways!

Alan Flancman
President
Monetary Dynamics, Inc.
Toronto

Cheers for Kahn

Thanks for such an upbeat article about Philippe Kahn and Borland ["Give Kahn credit," CW, Jan. 30]. Before Quattro Pro, Lotus didn't have a real competitor in the spreadsheet market. And what would spreadsheets look like now if not for competition? Probably not much different from Lotus 1.0.

Kahn deserves more praise than he gets. I hope Borland is able to turn it around and become a software industry leader once again.

Thanks to Kahn for the dedicated work, and thanks to you for having the guts to stand up and praise someone while everyone else is on the critical bandwagon.

Mike Cornwell
Perryville, Mo.

Seldom were truer words spoken about Philippe Kahn's contributions to the industry. I, for one, hope the industry still holds opportunities for Kahn and that he still has the desire to pursue them.

Tim Nimmo
Giant Industries, Inc.
Scottsdale, Ariz.



■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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Backstabbing your way to the top in IS

Michael B. Cohn

Come on folks, no one's fooling anybody. High-tech team building? Shared risk and reward? Peer evaluations? It's all a bunch of garbage!

IS is ruthless. Backstabbings run rampant through the compucubicles of America. I've seen them all . . . from the innocent "kick me" sign to the devastation of a laptop by a well-aimed water balloo.

As respoosible IS professionals, it's time to put our collective foot down. Stop the pranks! End the torment! Stamp out IS backstabbing once and for all! Or at least lay low for a while, and keep a few beauties like tbese np your sleeve:

• **Comma-raderie:** This is a great way to impair someone's programming career, and all it requires is a little syntax sabotage. Simply tamper with a teammate's job control — delete one little comma. The guy submits the month-end payroll and the job mysteriously goes down. The next thing be knows, be's heading to the office at 1 a.m. or rushing back from vacation. I've found that three or four comma-raderie episodes are remarkably effective.

• **Wreckuirements:** Sometimes us old IS dogs need to slow down a few code-cranking youngsters. Try leading a few puppy-like programmers astray just by screwing up a couple of specs. Wait till they're 18 months into a 12-month project, then announce that everything was supposed to be written in both C and macro Assembler. That should keep them out of your way for a promotion or two.

• **Ad hog reporting:** This is a surefire way to thin the ranks. Wait until some snarling CEO demands special reports from your cubiclemate. But when be tries to run a program, he discovers that every required file, tape or library is being hogged by some super-special batch job,' which mysteriously continues to run for the next several hours, days, weeks, etc.



Try leading a few puppy-like programmers astray just by screwing up a couple of specs.

• **Manudgement:** Everyone bates management, but you can do something about it. Why not express a genuine interest in your boss's career? Discretely tell bim your big-cheese neighbor is looking for an IS management heavyweight. Tell him the job pays $140,000. Tell him there's six weeks vacation, a four-day workweek and travel only twice a year — to the satellite office in Palm Springs, Calif. Tell him to call a certain phone number and leave a confidential message. Don't tell him it's really the home pbone of his current CFO, who is known to value loyalty more than life itself.

• **Seizing greetings:** Finally, a foolproof way to eliminate the one or 12 folks standing between you and the top. Is Jim about to land that team leader spot? Get Jim's phone-mail password and he's cooked. Simply change Jim's daily greeting to something more creative, such as "Sorry, I'm not at my desk right now, but if you're calling about system problems, kindly place the receiver between your knees and bark like a dog." This works wonders, especially if it's the week before Jim's appraisal.

Cohn looks over his shoulder for backstabbing co-workers at a high-tech company in Atlanta.

Why Microsoft can't win on the Internet

Patricia B. Seybold

Microsoft is sowing tbe seeds of its own destruction. In the past, Bill Gates' company has excelled in estabbishing — or acquiring — market share and setting the rules of the game. Now, Microsoft is stepping onto a oew playing field: interorganizational communications and commerce. But no matter bow hard it tries to co-opt the Internet game, Microsoft will become jnst one of 1,000 players vying for mind share and market share on what is truly a new level playing field.



No matter how hard it tries to co-opt the Internet game, Microsoft will become just one of 1,000 players.

Microsoft has proved its brilliance in sbaping the playing field and dominating tbe game in the microcomputer industry. One of the best examples of this mastery was the pricing and packaging of Microsoft SQL Server. By offering a bundled NT/SQL Server package at about one-tenth the cost of previous hardware and software combinations for relational database servers ($10,000 vs. $100,000), Microsoft changed the rules.

U.S. District Court Judge Stanley Sporkin's attempt to strike down the antitrust settlement Microsoft reached with the Justice Department was a recognition of this pattern of behavior and an attempt to stop it. Why, Sporkin most bave thought, should Microsoft be allowed to establish — through the acquisition of Intuit — another monopoly. By dominating the area of personal finance and tax preparation software, Microsoft could redefine the field of electronic commerce. Why should it get to dominate both the microcosm (the microcomputer industry) and the telecosm (the telecommunications industry) by linking its Microsoft Network electronic marketplace to the dominant PC user interface (Windows), making Microsoft the default standard for buying and banking in cyberspace?

The Internet is a playing field that Microsoft cannot control. Part of the Internet's appeal is that nobody can control it.

It evolves, like any community, according to laws that are larger than life. It is self-limiting and self-perpetuating. Microsoft can enter the Internet game as a network of networks. Microsoft can make it easier for the uninitiated to gain access to the Internet. Microsoft can help bolster security on the Internet by offering encryption software. And Microsoft can try to co-opt the most powerful force on the Internet today, the World-Wide Web. All of these moves are appropriate and useful for businesses that are stampeding onto the electronic frontier. But let's look at the likely outcome for Microsoft.

The best place to look for clues is the Web. The rate at which businesses and individuals are setting up home pages and Web servers is astronomical. It is nothing short of a true gold rush. Microsoft is enabling this onslaught — and selling NT servers in the bargain — by offering easy-to-use tools that enable you to create your own Web server, easily convert any MS Word document into HyperText Markup Language (Web format) and create your own set of hyperlinked information, catalogs and services in a matter of hours. This is great. It enables any smart person with a few dollars to spare to hang their shingle on the electronic highway.

But by making it easier for customers to convert their files into Web format, Microsoft is ceding its power over the market. Once all of our shared information is in a truly industry-standard open format, Microsoft will lose its cloot. No longer locked into Microsoft's applications and interfaces, we will be free to adopt any newcomer that comes along with a better idea. Having let us all onto the new playing field, will Microsoft be able to *control* the evolution of the Web? No way. It isn't co-optative, and Microsoft doesn't know how to play a game it can't win.

Seybold is president of Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold@PSOCG. Her Internet address is PSeybold@PSGroup.com.

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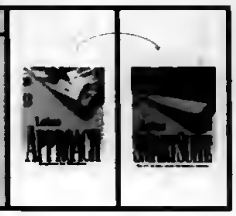
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Mac apps set for speed boost

By Mark Halper

Although Apple Computer, Inc. boasts that some 545 software titles have been written for its year-old PowerPC-based Power Macintosh line, many information systems shops are still running older programs written for Apple's 680x0 line on their Power Macintoshes.

Those users are eagerly awaiting the fruits of two competing developments — one that users say is going on at Apple and the other at Connectix, Inc. in San Mateo, Calif. — that would provide faster performance of 680x0 software on Power Macintoshes.

Both companies are developing emulation software that sources said is expected to increase the speed of 680x0 programs by two to three times their current rate on Power Macintoshes.

Connectix, which is known for developing Macintosh enhancement tools, including its recent RAM Doubler virtual memory program, may beat Apple to the punch. A spokeswoman said the company is targeting midspring availability of an emulator for 680x0 programs on the Power Macintosh. Some users consider that time schedule optimistic because the product reached its alpha stage only last week.

Apple declined to elaborate on its development project.

Speed is the issue

Although Apple has won high praise for the compatibility of 680x0 programs on the Power Macintosh, the speed of those programs on the newer line could stand improvement, users said.

"Right now, the computability is really hul-

Power Mac, *page 45*

Banks form front line in battle for operating system dominance

By Thomas Hoffman

The war may be over in the rest of the world, but the battle over PC operating systems has just begun in the banking industry.

Currently, more than half of the Top 50 U.S. banks are running their retail operations on IBM's OS/2 operating system. Those banks include KeyCorp in Cleveland, First Union Corp. in Charlotte, N.C., and Barnett Banks, Inc. in Jacksonville, Fla. Now, a familiar competitor, Microsoft Corp., has begun making inroads into what has traditionally been IBM's turf.

Future 95

But even though Microsoft recently landed several significant Windows NT contracts — including ones with Bank South Corp. in Atlanta and Centura Banks, Inc. in Rocky Mount, N.C. — the future of the market, according to banking watchers and players, will likely depend on how the industry receives Microsoft's Windows 95 environment.



Bank South's Al Schulman: *'Everybody's writing for Windows'*

"Windows NT is a larger system than OS/2 and is more adaptable to running the server than the client/desktop," said Bob Landry, a technology analyst at The Tower Group, a Wellesley, Mass., financial services and technology consultancy. "OS/2 is sized very nicely to support branch banking," Landry added, "but it will depend on whether Windows 95, which will be sized competitively with OS/2, can meet the performance and reliability objectives in a mission-critical environment."



Huntington's Rick Sellers: *'Windows doesn't stand up to OS/2 in multitasking'*

Most banking executives interviewed said they chose the operating environment for their retail operations based on the branch automation package selected. For example, when Bank South recently decided to upgrade its 145 retail locations from a DOS-based IBM 4700 branch banking environment, it selected Unisys Corp.'s Financial Business Architecture (FBA) Navigator application system. After choosing FBA, the bank had three operating environments to pick from: Windows NT, Unisys' CTOS and Unix.

"We were not going to Unix or CTOS. But we already had a lot of Windows experience here, and even though OS/2 currently has a leg up in the banking world, everybody's writing for Windows," said Al Schulman, an information services project manager at Bank South, which has $6.9 billion in assets.

Indeed, most of the leading third-party branch banking packages originally written for OS/2 — such as Dallas-based Argo Data Resources Corp.'s BankPro — have been or are being rewritten for Windows. For example, Charlotte, N.C.-based Broadway and Seymour, Inc.'s BancStar platform automation package will ship for Windows later this year.

Yet many banks that have opted for an OS/2-led branch banking approach have done so for compelling reasons — and not just because IBM is the pre-eminent technology provider to the industry. For example, Huntington Bancshares, Inc. in Columbus, Ohio, began installing Argo's BankPro on IBM OS/2 LANs at its 350 branches four years ago in an effort to provide its tellers and customer services representatives with a more sales- and services-oriented culture.

Even though Windows NT was not

Banks, *page 45*

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Getting connected to other networks usually means buying separate hardware. But with NetWare 4.1, multiprotocol routing comes built-in. And because NetWare's Multiprotocol Routing supports IPX, TCP/IP, Appletalk and others, it connects networks without the need for additional hardware. And not buying all that extra hardware can add up to big savings. Who could possibly be against big savings?

NetWare Network Management. Easily the most manageable network.

NetWare 4.1 offers unmatched management and administration capabilities. For example, it allows you to take full control of any server from anywhere on the network. It also has a new graphical user interface that lets you manage the

network as a single entity, instead of a collection of separate servers. So jobs that used to take hours can be accomplished in minutes. Plus, tasks like setting up users, granting security privileges and access to resources—tasks that were very time consuming with NetWare 3— aren't with NetWare 4.1. Click a few icons, then type information in a dialog box. You've just added another user to the entire network. It's quick and easy. Again—saving you time and money.

NetWare 4.1 Security Services. Simply the industry's most secure NOS.

One of the greatest concerns about any network operating system is how secure it is. NetWare 4.1 includes RSA security, the industry's most secure password encryption and digital packet signature technology. In fact, it was designed to meet the National Computer Security Center's Class C2 Network Security criteria. Look. If you can't afford to have confidential data in the wrong hands, that's reason enough to upgrade your network to NetWare 4.1 today.

NetWare 4.1 File Services. We just improved on perfection.

NetWare 4.1 shares the same industry leading file system as NetWare 3, except it also comes with terrific, industry leading enhancements. There's a server-based file compression feature that can double the size of the hard drive, leaving more room for data. And sub-allocation provides more efficient storage. It also provides optional large block sizes which speeds data transfer performance from hard drive to memory. And data migration reduces storage media costs by transparently migrating data to near-line or off-line storage. You know, this is a great way to avoid having to shell out the big bucks for more space later.

NetWare 4.1 Print Services just got smarter.

With NetWare 4.1, you can say goodbye to printing nightmares for good. NetWare 4.1 provides the most robust set of print services in the industry. It's terrific. For example, you don't need to know anything about the print server.

7 Key Services	NetWare 4.1	NetWare 3
1 DIRECTORY Global directory service	YES	NO
2 INTEGRATED MESSAGING	YES	NO
3 MULTIPROTOCOL ROUTING	YES	Add-on product
4 NETWORK MANAGEMENT Graphical user tools provide view of entire network	YES	NO
5 NETWORK SECURITY		
RSA public/private key	YES	NO
Restrict login to specific Mac address	YES	NO
Security auditing	YES	NO
6 FILE SYSTEM AND STORAGE Support for data-migration hardware, data compression and disk block suballocation	YES	NO
7 NETWORK PRINTING	256 per print server	16 per print server
Additional Services		
• INTEGRATED SYSTEM FAULT TOLERANCE LEVEL III	YES*	Add-on product
• CLIENT SUPPORT AND INTEROPERABILITY		
NetWare for Macintosh, Number of user licenses included	Included in Netware user licenses	5
Graphical user tools	YES	NO
• WAN SUPPORT Network link Service Protocol™ (NLSP)™	YES	Add-on product
• ARCHITECTURE		
Maximum number of user connections per server	1,000	250
Nondedicated server	YES**	NO
Single login to network	YES	NO
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All you need to know is the name of the printer and you're set. That's it. Plus, NetWare 4.1 Print Services maximizes your hardware investment because it allows up to 256 printers to run off one server (as opposed to NetWare 3, which limits you to 16 printers). Just think how much time, money, and hours of frustration this could save you.

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Still, we know all these features wouldn't mean diddly if they didn't work right out of the box. So we submitted NetWare 4.1 to rigorous testing—first we tested it at Novell labs, then the press took a crack at it, and finally, our toughest customers got their chance. It passed with flying colors. Without a doubt, NetWare 4.1 is set to take center stage in the industry.

We hope we've told you enough to get things underway. But in case you need more information about NetWare 4.1, just call Novell at 1-800-844-6661 or dial us in at http//www.netware.com. We'll do everything we can to help.

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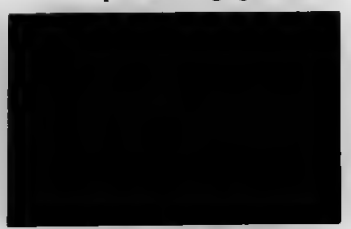
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Pentium nearly universal at high end

By Jaikumar Vijayan

Even as Intel Corp. predicted that systems based on its next-generation P6 processor would be available as soon as the fourth quarter, leading PC vendors were rapidly moving the high end of their corporate lines to Pentium chips.

Last week, for instance, Hewlett-Packard Co. in Palo Alto, Calif., and NEC Technologies, Inc. in Boxboro, Mass., introduced systems based on the 90- and 100-MHz Pentium processors. The systems come in at or near the top of their respective corporate lines and feature Peripheral Component Interconnect (PCI) bus architectures, high-end graphics capabilities and Desktop Management interface (DMI) compliance.

NEC Image P100E

Processor: 100-MHz Pentium (dual-processor-capable)

Memory: 16M bytes of RAM

Hard drive: 1G byte

Video: 2M bytes of video RAM, PCI local bus video

Multimedia: Quad-speed CD-ROM, 16-bit wave table sound, stereo speakers

Price: $4,199

Whither 486?

Pentium-based machines now predominate in HP's and NEC's high-end lines, though entry-level machines are 486-based. Other vendors such as Dell Computer Corp. and Gateway 2000, Inc. use Pentium chips exclusively in their corporate lines.

"Pentium performance is something we are definitely interested in," said Gazel Tan, MIS director at Preston, Gates and Ellis, a law firm in Seattle. The company has mostly NEC 486-based PCs, which it wants to upgrade to Pentium by year's end.

The firm, which uses the systems to run office applications such as word processors, spreadsheets, electronic mail and a few database applications, is looking to upgrade because of the better performance the Pentium offers, Tan said.

HP's new Vectra XU 5/100C PC will top the company's line of Pentium products. The dual-processor-enabled system comes with a 512K-bit external cache and features 64-bit graphics capabilities, with support for up to 4M bytes of video RAM. An additional socket on the motherboard allows users to add a second processor.

Pricing will be available when the product ships next month.

Meanwhile, NEC's new Image P90D processor will come in near the top of the company's desktop lines. NEC also said it has started shipping its 90- and 100-MHz dual-processor Image P90E and Image P100E systems.

NEC's Image series features 256K bits of synchronous cache, PCI graphics, quad-speed CD-ROMs and business audio.

HP and NEC have also both incorporated DMI tools that allow for management capabilities such as tracking of system serial numbers, model numbers and configurations across the network.

"It is the kind of feature that companies are looking for" for tasks such as asset management and inventory tracking across the network, said Mary Chin, director of marketing for NEC's commercial desktop systems.

"DMI compliance has become a big industry buzzword," agreed Richard Zwetchkenbaum, an analyst at International Data Corp. "It has become something like Plug and Play and Energy Star compliance," he said, adding that full DMI capability was still some time away.

Yet for Gary Richtmyre, a micro support manager at the West Bend Mutual Insurance Co. in West Bend, Wis., the emerging availability of desktop management tools and standards left him cold.

"We have already developed an in-house program that allows us to do asset management" and an inventory of LAN-connected PCs within the organization, Richtmyre said. The information is available over the network and is even capable of tracking the depreciation of systems over the network, he said.

Falling down

Prices of Pentium-based systems continue to fall rapidly. Last week for instance, AT&T Global Information Solutions announced that it was rolling back prices on its 60-MHz Pentium-based PC. A Globalyst 580 with 8M bytes of RAM and 270M-byte hard drive, which was $1,971 before the price cuts, will now sell for $1,399. Similar reductions are expected from other major vendors in response to Intel's recent price reductions.

Servers get into the act

Even as PC vendors attempt to push Pentium desktop performance into traditional low-end minicomputer space, at least one vendor is scaling down high-end servers to lower price points.

Last week, superserver vendor NetFrame, Inc. in Milpitas, Calif., introduced a family of servers that will come in at the entry level of the company's product lines.

The new NF8400 family of servers from NetFrame is based on Intel's 486 and Pentium processors and features Error Correcting and Checking memory, duplexed drives and redundant network software, a spokesman for the company said.

The servers, which are being positioned as midrange departmental and application servers, can be configured with two to nine clustered processors — system, I/O and application — and run standard, off-the-shelf shrink-wrapped operating systems and software, NetFrame said.

An entry-level NF8410 features a single I/O bus system and supports up to two separate I/O servers in addition to the CPU. A top-of-the-line NF8440 features a quadruple bus system supporting a combination of up to eight I/O or application servers in addition to the CPU. The system is aimed at users seeking to consolidate multiple smaller networks or for interactive network applications including video on demand, NetFrame said.

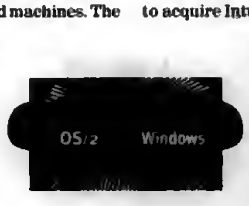
Prices for the new family start at $25,000 for the NF8410 and $40,000 for the NF8440.

— Jaikumar Vijayan

Banks

CONTINUED FROM PAGE 41

available in 1991, Huntington Bancshares recently recommitted to OS/2 as part of a three-year effort beginning next month to upgrade nearly 2,000 IBM PS/2 workstations and servers to Intel Corp. Pentium-based machines. The reason is OS/2's ability to do robust multitasking at the workstation level, according to Rick Sellers, president of Huntington Service Co. in Columbus, the bank's operations and technology arm.



"Windows doesn't stand up to OS/2 in multitasking, and we have put so much functionality on our banking applications that it would bring Windows to its knees," Sellers said. Even though Windows and Windows NT would have worked in Huntington Bancshares' branch environment, Sellers said the Microsoft systems would have been too slow to allow its customer representatives to leverage multitasking for cross-selling opportunities.

But for all of the debate between OS/2 and Windows NT/Windows 95 in the banking arena, market dominance may well hinge on future industry developments.

In the next five to 10 years, as home banking pervades the market, Microsoft figures to be even more keenly positioned in retail banking — especially if the Department of Justice allows the Redmond, Wash.-based software giant to acquire Intuit, Inc. in Menlo Park, Calif., and its market-leading Quicken home banking products.

Crucial decision

Because of the burgeoning electronic banking channels, a bank's selection of a retail platform "is as important a decision as when mainframes were king and people were choosing between RCA, GE, IBM, Burroughs and NCR machines," said Richard Crone, senior manager of financial services at KPMG Peat Marwick in Los Angeles. Because Microsoft already has approximately 85% of the total U.S. desktop operating systems market, a bank's decision to go with OS/2, Crone said, "is like betting on CPM in its early days."

68K apps on tap for Power Mac

CONTINUED FROM PAGE 41

letproof," said Michael Keithley, IS director at Creative Artist Agency, a Beverly Hills, Calif., talent agency. "But if you could get better performance, that would be good."

Not that current emulation is torturously slow. Keithley noted that on the top-of-the-line Power Macintosh 8100, 680x0 programs run at about the same speed as on a high-end 680x0 Macintosh Quadra. And on an entry-level 6100 Power Macintosh, performance is comparable to software running on a midrange Quadra, he said.

But as Bob Anderson, senior analyst at A. O. Smith Automotive Products, Inc. in Milwaukee, said, "At this point, I would have to say that to some extent, big business users are looking forward to a little bit better emulator."

For Anderson, better emulation would mean faster performance of his FileMaker database on Power Macintoshes. Claris Corp. in Santa Clara, Calif., makes FileMaker.

"It has not gone native, and we use it pretty extensively. Its speed could use a tweaking," he said.

Keithley counted Des Moines, Iowa-based CE Software, Inc.'s QuickMail electronic mail and Portland, Ore.-based Now Software, Inc.'s Now Update calendar among the 680x0 programs he runs on Power Macintoshes.

One common program that would benefit from better emulation would be Microsoft Corp.'s Word 5.1. Because the native PowerPC version has been disastrous [CW, Oct. 10, 1994], many IS users, Keithley included, have decided to stay with Version 5.1, which was written for the 680x0, he said.

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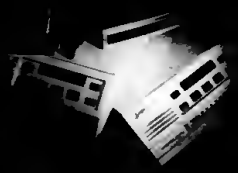
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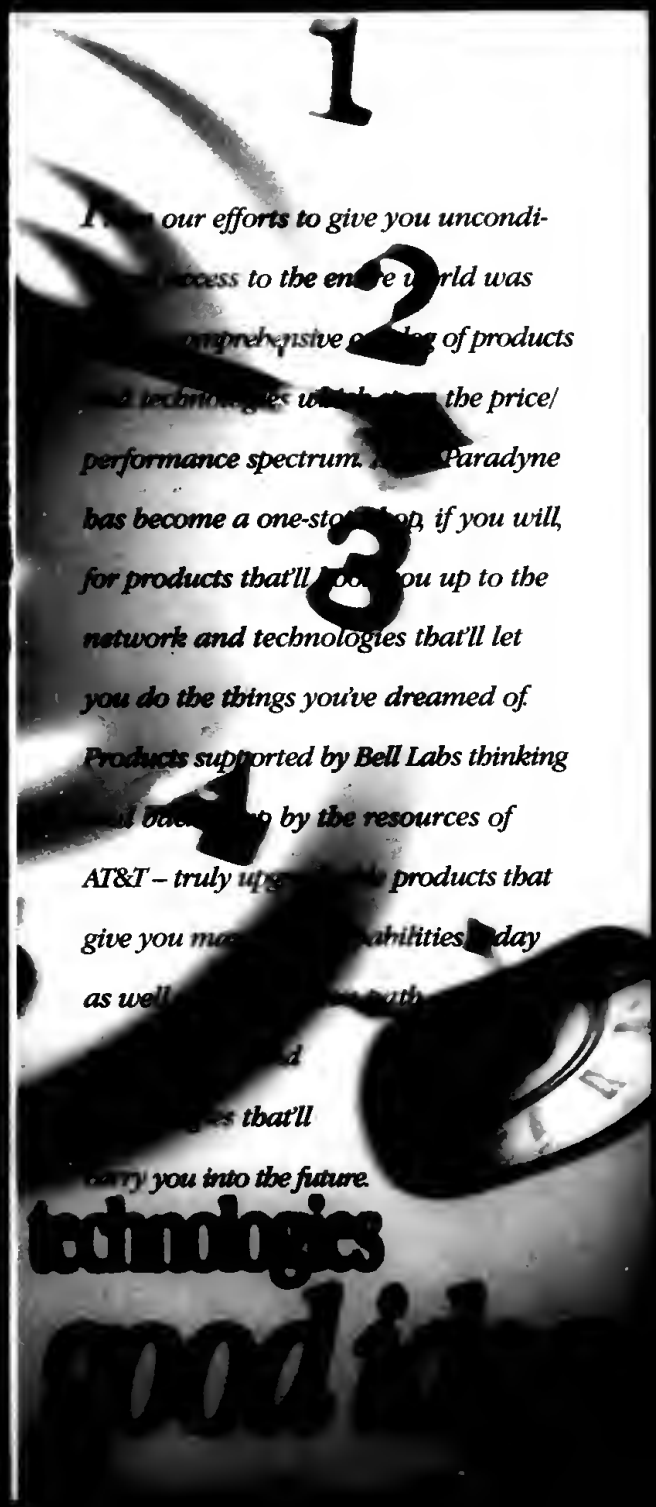
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Jeffrey Henning

Dominant Microsoft here to stay



"Sporkin, Sporkin, he's our man, if he can't do it, no one can!" Rivals worried about Microsoft's dominance might be chanting this about the judge who rejected the Justice Department's slap-on-the-wrist antitrust settlement with Microsoft, but these rivals' euphoria will fade, as quickly as San Diego's hopes against the San Francisco 49ers faded during the Super Bowl.

Why? Well, for the moment, make the unlikely assumption that Microsoft's rivals' dreams come true. Assume Microsoft was split into two separate companies: an operating system company and an application software company. Such a move would in no way reduce Microsoft's dominance of the application software market.

Microsoft's strength is that it does not approach any one application category in isolation but looks at each market, from spreadsheets to application development to consumer titles, as being related. To switch from football metaphors to genetics, Microsoft is always cross-pollinating its most fertile products, creating hybrids to adapt to new business climates and push the older life-forms out of the ecosystem. Examples abound.

■ 1991: Microsoft is the only application company with a major spreadsheet, word processor and presentation package and is up against three established DOS competitors, each strong in one market. The transition to Windows was the left hook that stunned Lotus, WordPerfect and Software Publishing (the Harvard Graphics folks), but the punch that knocked them out was Microsoft's Office. The suite redefined the rivals' markets, forcing them to compete on Microsoft's terms. The result was a stunning success for Microsoft. Dataquest reports that Microsoft had an amazing 87% of the suite market last year.

■ In the second chapter of the suite story, Microsoft bundled Access with its Office Professional, blitzing a downed Borland (previously the database conference champ) while continuing to build market share for Access at the expense of Paradox.

■ Microsoft's Visual Basic was doing great — it made visual development of Windows applications possible — but it was not industrial-strength and faced competition from high-end, database-oriented application environments. Microsoft's answer? Bundle the Access database engine with Visual Basic. All of a sudden, Visual Basic had even more appeal as a serious tool, and Access gained from an easy-to-use but powerful development environment.



■ This year, Visual Basic 3.0 is becoming the leading corporate development environment, but Microsoft has to head off a Borland resurgence with Delphi 95. Microsoft's answer? Bundle a stripped-down version of Visual Basic (Visual Basic for Applications, or VBA) with Excel. VBA is scheduled to be integrated into Microsoft's Word (replacing WordBasic) and Project. The result? Microsoft will have a compelling argument against Borland: Office will become a suite of developer objects available to Visual Basic corporate programmers in effect for free because most companies now have Office installed.

■ Microsoft's Money was getting clobbered by Intuit's Quicken, so Microsoft bundled Money with Works, which had just been passed as market leader by Claris' ClarisWorks. This helped differentiate Works and built a base for Money the only way it could be built — by basically giving the product away.

Software offers unique economies of scale. Hardware manufacturers can't simply combine appliances to create new appliances at little extra cost (have you bought a TV with a built-in CD player lately?), but software companies can leverage multiple products for little more than the cost of a few extra disks. In the software business, whoever can field the most components wins, and Microsoft's application division, even theoretically stripped of close ties to the operating system division, has the best chance of doing this.

Sporkin may have scored an upset, but even a divided Microsoft will still dominate the application business the way the NFC dominates the AFC in football. Sporkin's cheerleaders had better get off the sidelines and back into training.

Henning is an analyst at consulting group Constellation International in Norwell, Mass. He can be reached on CompuServe at 74774,157.

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Ambitious plans by SCO aim for Unix/Windows cooperation

By Stuart J. Johnston

After years of being a quasi-competitor to Microsoft Corp., The Santa Cruz Operation, Inc., vendor of the most popular Unix system for Intel Corp.-based PCs, has decided on a "peaceful coexistence" model for how it will cope in a Windows-dominated desktop world.

Santa Cruz, Calif.-based SCO recently revealed that a key component of that strategy will be a suite of tools to help users and developers create Windows-based applications that transparently access the features and data available on servers running the popular Unix versions. Those tools are set to begin rolling out this year.

Company executives would not reveal precisely what products are on tap and how they will be packaged. But they said the products will include a terminal emulator that automatically gives character-based host applications point-and-click ease of use, Open Database Connectivity (ODBC) support for popular Unix databases and application programming interface (API) support in Unix for popular Windows APIs.

These capabilities will enable users of Windows 3.1, Windows for Workgroups, Windows 95 and Windows NT Workstation to more tightly integrate with servers running Unix versions from SCO, IBM, Hewlett-Packard Co. and Sun Microsystems, Inc., said Chris Holmes, president of Visionware Ltd., which SCO acquired in December.

"Our terminal emulator will autolog you in, enter sales by pressing a button [and be] programmable with [Microsoft's] Visual Basic," Holmes said. The emulator will run on a Windows client.

System management features

Other tools will include a product to handle file duplication and replication as well as software distribution. It will be "a sophisticated file distribution tool so that you can take a file created in [Microsoft] Excel and put it on a server and send it out to users" in a manner similar to the kind of services provided by Microsoft's Systems Management Server on Windows NT, Holmes said.

Support for various Windows APIs, such as the Messaging API, Object Linking and Embedding, Telephony API and ODBC in Unix, will also enable user-developers to take advantage of popular Microsoft programming tools and tools from other vendors, Holmes said. Clients will be able to communicate using any networking systems or communications protocols supported by the underlying Unix platforms.

The first products from SCO's initiative, code-named "Envision," will debut this year. SCO officials did not delineate product specifics or pricing and did not say whether the tools would be bundled with SCO's own Unix offering.

Ability Plus Software America Ltd. has announced Ability for Windows, a business software suite with word processor, spreadsheet, database, forms, drawing, charting and communications modules.

According to the Charlotte, N.C., company, Ability for Windows features easy communication among modules and an Ability Library Manager that integrates the modules. The Library Manager lets users browse, search, copy, print, delete and set options from one location.

The product uses less than 20M bytes on a hard drive and includes import/export filters to handle other popular stand-alone applications

Ability for Windows is compliant with Microsoft Corp.'s Object Linking and Embedding 2.0. Windows Help, Quick Tutor and Quickcards help files are available to users. Quick Tutor provides tutorials for each feature, and Quickcards provides a step-by-step listing of how to perform each task.

Ability for Windows costs $229.

▶ *Ability Plus Software*
(704) 364-3346

MediaWay, Inc. has announced MediaDB, an object-oriented multimedia database management system.

According to the Santa Clara, Calif., company, MediaDB provides built-in compression technologies to handle image and sound objects and built-in video, sound and image playback tools.

The product supports SQL and includes multimedia-specific transaction management and performance enhancements for image displays and compression.

Prices start at $10,000 for 20 users.

▶ *MediaWay*
(408) 748-7400

Mind Path Technologies has announced Mind Path tR55-FX remote control for computer-based presentations.

According to the Dallas company, Mind Path IR55-FX features Infrared Data Association compatibility, five-channel switching and animation-on-demand that provides control of a Windows-based PC.

Presentation F/X Pro software is included with the remote and lets users add special effects on the fly. The remote has a range of up to 50 feet with an external receiver attached.

Mind Path IR55-FX costs $229

▶ *Mind Path Technologies*
(214) 233-9296

Software Ventures Corp. has announced MicroPhone Pro for Windows 2.0, communications software.

According to the Berkeley, Calif., company, MicroPhone Pro for Windows 2.0 provides a TCP/IP stack that lets users access the Internet through Point-to-Point Protocol, Serial Line Internet Protocol and TCP/IP network connections or dial-up shell accounts.

Features include Internet electronic mail, a newsgroup reader, Telnet, Kermit and CompuServe B+ file transfer protocols. Users can add their own modem drivers, and the product supports a universal modem driver.

MicroPhone for Windows 2.0 costs $129.

▶ *Software Ventures*
(510) 644-3232

Canon Computer Systems, Inc. has announced BJ-200EX, a monochrome bubble-jet printer.

According to the Costa Mesa, Calif., company, BJ-200EX prints 4 page/min., provides high-quality monochrome graphics and has a resolution of 720 by 360 dot/in.

A smoothing capability refines the text printout by polishing the jagged edges and ragged curves of printed characters.

BJ-200EX costs $269.

▶ *Canon Computer Systems*
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DMI gives rise to audit worries

By Steve Moore

With the recent completion of a new software-oriented component of the Desktop Management Interface (DMI) standard, both users and vendors stand to gain more control over the deployment and management of PC software. But the prospect of greater control for vendors raises some concerns for users.

Many stand-alone PC applications have evolved into intricate client/server applications that must be managed in accordance with increasingly complex software licensing agreements. Even as users contend with ongoing network management and systems management challenges, they must master a third major technology management discipline: application management.

"Most of the problems I experience are not hardware-related anymore. They're software-related," said Alex Gonzales, a network administrator at Farm Stores, Inc. in Miami. "[Management] information coming from software would definitely be a plus."

Words of caution

The new DMI Software Management Information Format (MIF) standard was created by the Desktop Management Task Force (DMTF). The industrywide vendor consortium claims the standard will ease users' internal software support and auditing burden while helping vendors and industry associations accomplish external software audits.

"The intent is to be able to identify what software is actually installed on workstations and, based on that information, determine whether the company has the proper licensing for that," said Winston Bumpus, chairman of the DMTF's software working committee.

But analysts caution users to pay close attention to the methods vendors use when they conduct external audits, whether done on-site or remotely through capabilities that will be added to the DMI by the end of this year.

"Some companies would probably have very strong objections to any [remote software auditing functions] if they don't have an option to turn them off," said John McConnell, president of McConnell Consulting Co. in Boulder, Colo. A vendor ostensibly auditing its own products could obtain "all kinds of information about a company's operations," he said.

"Making the [Software MIF] information available is not the problem. It has to do with how vendors use it," said DMTF chairwoman Shannon Gray-Voigt. Because software vendors could snoop for information about user companies — or those companies' use of competing software — while conducting audits, "it's a vendor credibility and trust issue," she said.

Group backing

The Software Publishers Association (SPA) and the Business Software Alliance have stated that they will accept the use of the DMI Software MIF as a method of proving whether a product exists for external auditing purposes. SPA Executive Director Ken Wasch said the Software MIF "is very valuable in terms of helping users manage licenses, and we encourage its implementation across the industry."

The first software management applications to implement the Software MIF will likely be in users' hands by early 1996. But users will face a transition period during which some vendors will continue to ship applications that do not support the MIF, Gray-Voigt said.

The DMTF is working to complete an enhanced version of the Software MIF by the end of this year. "Some of the key things to add to it will be information about the install/deinstall process and identification of dependencies," Bumpus said. Today, when users install or deinstall an application, "they don't know what other hardware or software components it relies on or [that] rely on it," he explained. But those dependencies will make application management difficult unless software publishers make that information publicly available, he said.

Bumpus added that Software MIF information in the future will be valuable to outsourcing firms handling user companies' application management functions.

DCE projects on front burner, page 72.

Stock exchange adds Unix

Revamp targets increased volume on trading floor

By Jean S. Bozman
NEW YORK

The New York Stock Exchange, a longtime bastion of mainframe computing, is adding a layer of distributed Unix servers to its data-processing mix. The move to add 250 Hewlett-Packard Co. Unix servers — and nearly 2,000 X Window System terminals for end users — is part of a $125 million project to update floor-trading systems by 1996.

The Securities Industry Automation Corp. (SIAC), which supplies the New York and American stock exchanges with computer processing services, is designing the system. The rollout of new applications, Unix servers and high-speed networks on the New York Stock Exchange is expected to create modular systems that can be changed out as needed without disrupting operations.

SIAC Chief Executive Officer Charles McQuade said the distributed servers offer a more flexible approach to updating systems over time. Now that all terminals are plugged into the same high-speed backbone network, any single element can be replaced without halting operations, and new data services can be introduced more easily.

In addition, users will be able to log on from any X terminal on the exchange floor. "One of the things this enables is a 'locationless' processing environment," McQuade said, noting that the older architecture required traders to work from particular data terminals.

The HP servers will provide centrally managed data to X terminals scattered all over the trading floor, said Joe Kubat, vice president of NYSE floor-trading systems development at SIAC. But the security of the data transmitted will be ensured by its origin on centralized IBM and Tandem Computers, Inc. mainframes and by information systems management of the Unix servers, SIAC said.

Onward and upward

The objective of the trading-floor revamp is to allow trading volumes to climb while the traditional open-outcry trading on the exchange floor is maintained. As before, secure mainframes push high-speed on-line market data to the floor, where trades occur. The trades are then recorded on terminals for closeout on mainframes. Prior to the introduction of HP Unix servers on the floor — some of which were installed in January — a set of 180 special-purpose computers acted as front ends between back-office mainframes and dumb terminals on the trading floor.

The move to Unix servers originated in 1991, when SIAC undertook a study of how to replace aging terminals and deliver a diverse set of services from outside information vendors to the 700 NYSE floor traders. The study was part of the exchange's Integrated Technology Plan, which includes upgrading point-to-point dedicated data lines into a unified high-speed fiber-optic network that delivers all services.



SIAC's Joe Kubat: *Security and administrative ease are two reasons for using X terminals*

On Site

New York Stock Exchange
New York

Challenge: To install a new layer of technology on top of a mainframe-driven stock-market system. To gain the flexibility to change systems more easily, localize failures and provide access to centralized data.

Strategy: Use Unix servers to supply common applications and services, X terminals to display server data and mainframes to secure mission-critical transactional data. Tie everything together with high-speed fiber-optic networks.

Results: Rollout of distributed Unix servers and X terminals began in January and will continue through 1995. Unix servers relay market data from glass-house mainframes and secure data for access by floor traders.

Top priorities

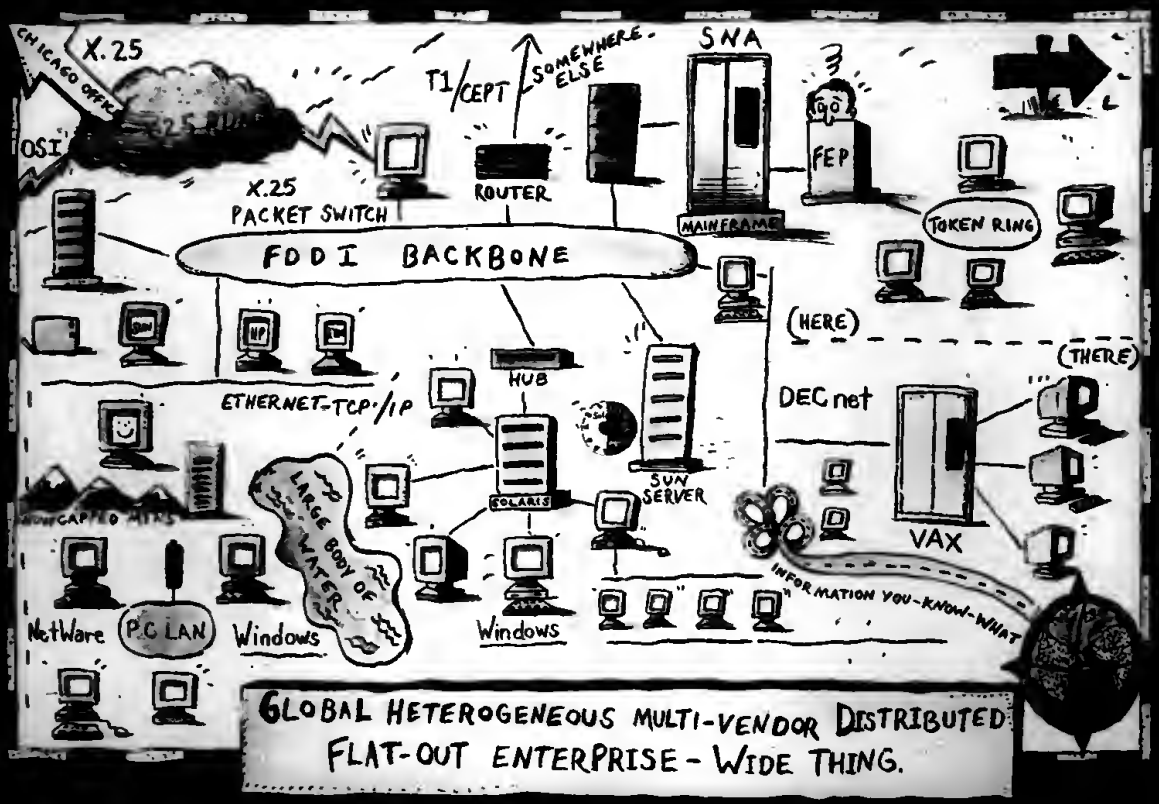
The ability of the new systems to supply timely and reliable market data to traders is paramount in the redesign effort. Traders will see groups of stocks arranged in windows on the screen of X terminals hooked to the HP 3-series and 9-series servers. "We're not using workstations or PCs in our services for two reasons," Kubat said. "One is security and the other is administrative ease."

Logging on from X terminals is more secure than logging on from PCs because PC users can export data onto floppy disks. In contrast, X terminals display shared data that is secured and managed on the Unix servers. User identification, security software and systems management can be managed from just a few IS sites, instead of one PC at a time.

However, individual brokerages and specialty firms operate their own PCs on the trading floor. If all goes as planned, some of those PC systems will be able to latch on to the backbone network because the exchange is making its application interfaces available to member firms. Trader and exchange member Richard A. Rosenblatt said he expects that some of the broker PC systems will soon be able to access the exchange's on-line market data.

"If any member firm develops an in-house system they feel is superior, that will be able to interface with the systems the exchange is developing," he said. "The idea is

Stock exchange, *page 57*



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David P. Rodger, Vice President, Corporate Architecture, Sequent Computer Systems, Inc.

Tom Robben, V.P., Application/ Strategic Architect, Core Cash & Security Systems, J.P. Morgan

Clifford Rushton, MIS Director, Federal Paper Board

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Panel:
Tsvi Gal, Senior Vice President, Client/Server Systems, Bank of America

Robert Yellin, Chief Technology Officer, Legent Corporation

William Zeitz, President, Zeitz & Associates

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Chuck Parrish, General Manager, Mobile Data, GTE

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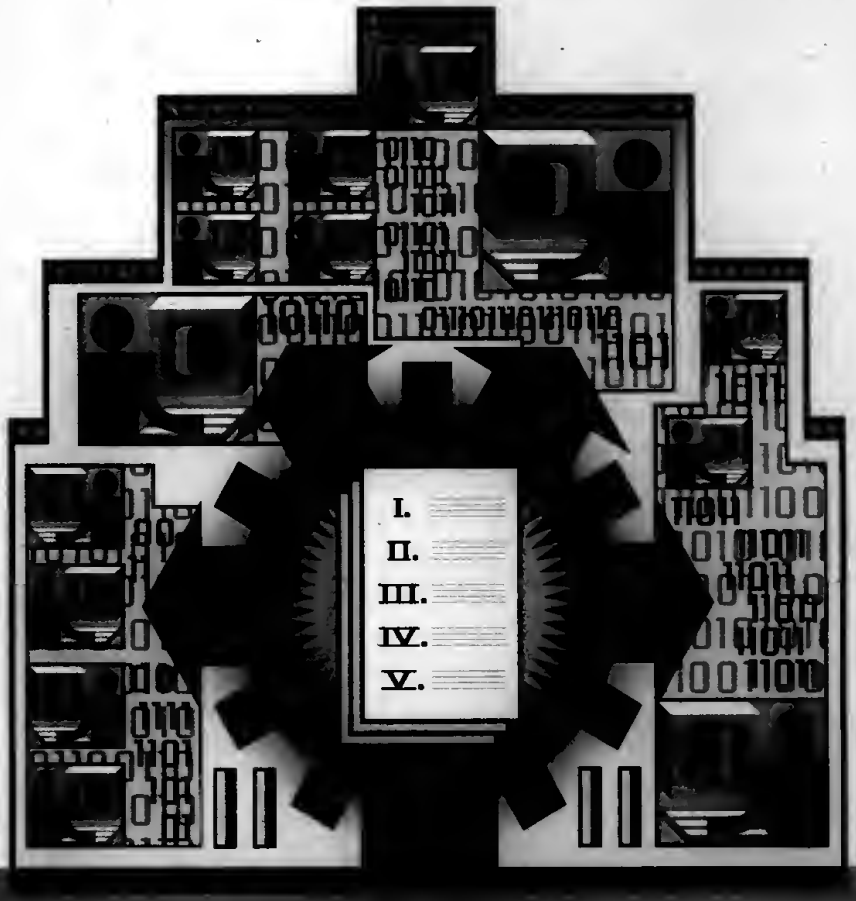
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Ronald S. Elkin, Program Manager, Battelle Memorial Institute

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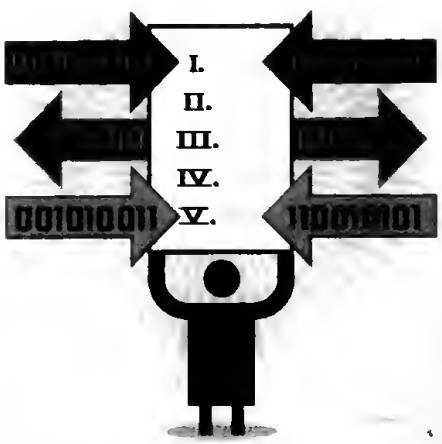


PAUL A. [illegible]

GOVERNANCE

GOVERNANCE: *The new IS agenda*

BY PAUL A. STRASSMANN



Information is power, and information politics is the art of achieving and maintaining power. As companies move away from a traditional hierarchical structure, IS managers need to rethink the politics of information management.

UNTIL RECENTLY, the dominant model for managing information within an organization was a command and control hierarchy, where the access to and distribution of information was administered by a privileged technical elite. They established a monopoly position over the production and distribution of that information and dictated how information technologies were used.

Of course, the days of rigid hierarchy are over. As information technology becomes more ubiquitous and distributed systems gain wider acceptance, the democratization of information accelerates. To be more responsive to the customer and to become more nimble competitors, companies have driven access to information and decision-making capabilities deep into their organizations. This transition from central hierarchies has resulted in master architectures, standard technological choices and uniform business practices becoming virtually unmanageable.

How information systems managers respond to these chaotic changes will determine, in part, how well their companies perform in the future. To adapt to this new environment, senior IS managers must embrace a new discipline that elevates the politics of information to the status of serious analysis. Specifically, they must create new institutions and processes, including formal "information constitutions," to cope with the fundamental changes in how organizations manage information.

Information Superiority

I have studied the cost structures, technological developments and levels of computer expenditures of business organizations in great detail for many years. The evidence is overwhelming that identical information technologies with the same levels of expense applied in identical industry sectors with identical competitive conditions may result in totally different economic performance. After 20 years of examining the facts, I have concluded that the lack of correlation between computer investments and operating results is largely attributable to differences in the ways organizations govern themselves. The superior performers do not waste people and technology to conduct mostly intra-organizational transactions but instead deploy information technology almost exclusively where it creates customer value.

Therefore, managing IS should be, first and foremost, a matter of governance and only sec-

ondarily a matter of technology. Governance describes what information management should be all about: the allocation of control over the creation, distribution and use of information. Without a generally accepted understanding of the complex organizational relationships and a means for resolving internal disputes, an IS manager will divert his energies to dealing with internal coordination instead of focusing on value-creating external opportunities.

This new environment requires organizations to distinguish between information management and information technology management: The former is concerned with governance, while the latter focuses on providing technical solutions for specific business needs. Delivering appropriate information technology is (and should continue to be) the responsibility of the chief information officer. But in the new era of fully distributed systems, the CIO typically is not the person responsible for information management. Instead, every manager must become an information manager with some say over the governance of that information.

The CIO should manage the technical aspects of governance such as establishing standards for open systems or database management. Every manager who is accountable for business results should be responsible for the business aspects of systems design and for the operating performance of information systems.

Strive for IS Federation

Of course, conflicts will arise when many managers at different levels of the organization have say in information management. Information management among business units and headquarters would operate best as a multilayered federation. Federation is a form of government in which sovereign power is balanced between a central authority and a number of constituent political units. In a federation, central authority is independent of the units. For example, the United States is a federation, with the federal government independent from the states' government yet related through a constitution that balances the power vested in each government.



Governance describes what information management is all about: the allocation of control over the creation, distribution and use of information.

Note that federation is different from confederation, in which elements unite for a common purpose without giving up any sovereignty. In a confederation, or a league, all authority remains with the units unless they agree to delegate specific roles to a collective body. NATO is a confederation because individual states have retained all rights to decision-making.

Consider IBM's recent vacillation between a federated and confederated form of organization, which exemplifies the damage an organization can suffer. Under the leadership of John Akers, IBM reorganized into independent strategic business units, abandoning the idea of offering corporatewide systems and integration capabilities. The ensuing chaos about roles and missions, especially with regard to the handling of major customer accounts and coordination of geographically decentralized national units, largely paralyzed the entire corporation into competitive unresponsiveness and rapid market share erosion.

Some corporations claim to be federations

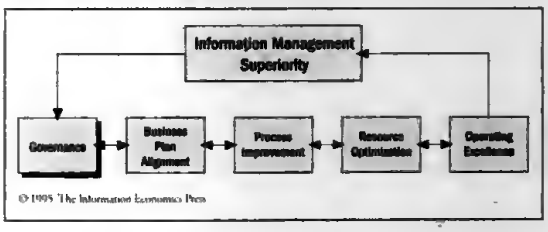
Governance Precedes All Else

GOVERNANCE IS THE ART of exercising power and achieving corporate consensus. Without consensus, IS managers cannot create information superiority, which I define as the capacity to increase economic value faster than the competition.

For instance, before senior IS management can align information technology investments with business plans, it must devise a universally accepted method of resolving disputes, such as how much autonomy a division should have. Without conflict resolution, business units and individuals will persist in competing for funds, resulting in ineffective, redundant and possibly counterproductive information technology projects.

Similarly, business process improvement projects cannot proceed safely if there are too many unsettled questions about authority and business priorities. For example, does a production foreman have the authority to modify production schedules to cope with local irregularities?

Governance allows companies to optimize the allocation of IS resources. And without governance, there can be no operational excellence. Resources will be wasted on nonvalue-added procedures, costs will go up, and productivity will suffer. The simpler the governance framework, the more likely workable systems solutions can be developed.



Cover and inside illustrations by Jean Tuttle



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but actually operate as confederations. A confederation exists when a consolidated corporate information organization is divided among the individual business units while a small corporate staff is retained with a largely undefined and emasculated mission. In this scenario, a CIO with the task of accomplishing federation goals cannot succeed, regardless of how much he can influence the optimization of computer operations.



The lack of correlation between computer investments and operating results is largely attributable to differences in the ways organizations govern themselves.

Federation governance follows the principle that everything not retained under a constitutionlike process is automatically delegated. In a federated structure, computer systems managers at headquarters would concentrate only on those decisions that concern long-term, enterprisewide interests, as defined by the rules of the federation. The accountability for everything else would pass to the next echelon, or layer, which may be a group or division. Likewise, that group or division would delegate lower-level responsibilities to regions, districts, branches and teams. In this way, everyday operations would not be hindered by higher-level interference, and accountability for delivering results would remain unambiguous. Each layer in a federated organization should retain only as much coordinating authority and funds as are necessary to perform the assigned tasks.

I have spent much time preparing organizational charters, conceiving architectural reference models, drafting statements of principles, issuing declarations of information policy goals, preparing statements of responsibilities and generating corporate standards manuals. Most of these approaches cannot adequately resolve lingering corporate conflicts. Organizations can resolve conflicts only through a formal governance structure that ensures a consistency among general organizational pronouncements, measures of performance and the division of budgets to correspond with the proposed work.

A Constitution Master Plan

The simplicity of the U.S. Constitution is a good template for information policy guidance. It addresses the governance of complexity, concentrating only on setting out fundamentals while leaving everything else to be resolved by means of due process and institutions designed to continually adapt to changing conditions.

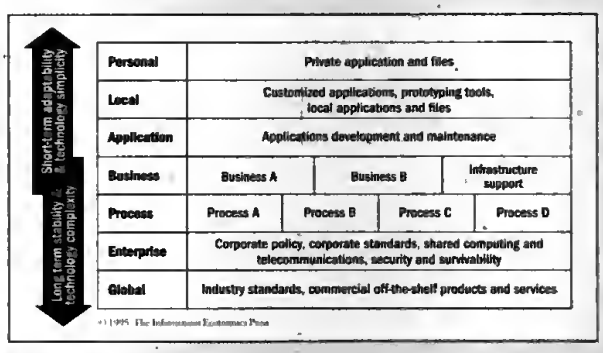
We could adapt the federalist thinking of Thomas Jefferson, James Madison and John Adams to make autonomous, knowledge-based organizations viable in an increasingly interdependent world. The founding fathers conceived a master plan to endow a new nation with principles that have endured as the nation has evolved from an agrarian society to a postindustrial global power. This model enabled the U.S. to be transformed from a monarchy

The Seven Layers of a Federated Organization

ALL ORGANIZATIONS have distinct layers similar to the federal, state and local layers of the U.S. government. As in a layered federalist government, a layered organization should have a constitution, laws, policies and a judicial system to provide a framework for how employees should act and interact.

At most, any organization can be represented in seven layers:

- **The personal layer** deals with all data that individuals may want to keep private, unless that privacy conflicts with the principles of the business.
- **The local layer** covers features unique to individuals, including report generation and processing of inquiries, for which higher-level standard processes are inadequate.
- **The application layer** deals with all features that support the specific operating needs of groups performing similar tasks, such as billing, inventory management and customer service.
- **The business layer** refers to all systems that are unique to the products or services delivered by an organizational unit, such as a consumer electronics division.
- **The process layer** covers all functions shared by different business functions and locations. Processes cut horizontally across functions such as advertising, finance and personnel.
- **The enterprise layer** deals with all services and standards that define the rules of governance for the organization's internal information systems.
- **The global layer** captures all functions, services and standards that ensure the interoperability of the enterprise with suppliers, customers and technology vendors.



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into a layered political system that continues to rebalance national, state, local and individual interests. The same model can help IS managers move to a fully distributed information environment.

An information constitution follows the principle of layered governance. There should be formal principles of conduct at each level in the organization. At most, an information governance structure should consist of seven layers: personal, local, application, business, process, enterprise and global (see "The Seven Layers of a Federated Organization," on the opposite page.)

Of course, every organization is unique, and there is no such thing as a standard information constitution. But the seven layers will likely capture all the important relationships within the organization, from the highest-level intercompany relationships to the relationship between an entry-level employee and his supervisor.

The objective of information governance is to place the maximum resources needed for short-term flexibility, adaptability and innovation as close as possible to the local level. Long-term interests — especially those that require a major, sustained commitment of resources — should be near the enterprise level for control and funding. For example, local operators should manage the selection of report formats and training methods. The design of network control, information security policies and standard systems design tools development and data dictionaries should be managed at a higher level.



A comprehensive system of governance calls for the creation of institutions that are equivalent to those found in the legislative, executive and judiciary branches of the U.S. government.

Implementation

Information governance layouts such as architectures for telecommunications networks, software engineering, systems integration or data center operations already exist in some form in many organizations. What I find missing everywhere, however, is logical and organizational consistency in how all of these elements work together. Producing an information constitution for a complex organization requires hard work and a steady accumulation of amendments and interpretations, just as in politics.

To establish information governance, companies must do much more than just assign levels of responsibility to businesses, functions or processes. They must create institutions that are in many respects equivalent to those found in the legislative, executive and judiciary branches of the U.S. government to provide a comprehensive system of governance. In most corporations, the role of the legislative body is best constituted within the corporate operating committee. This committee will most likely appoint a number of subcommittees to deal with particularly difficult issues such as security, standards, outsourcing and long-range planning. The executive body should consist entirely of managers with profit responsibilities who may then choose how they wish to be served. The independent corporate judiciary role should fall to the auditors, who must be able to assess reliability and security as well as standards of performance.

Questions to Ask

The first step in creating an information governance is to ask some very basic questions about what and how information is managed and by whom. Here are some examples.

- Who gets what data, and who converts that data into information?
- Who balances the competing interests of the policymakers and those responsible for implementation?
- Who will benefit from the free availability of information?
- Who will manage the long-term information management commitments that are essential for delivering information superiority?
- Who will make what decisions? Why, how and when?

Here are some more complex questions:

- How should my organization deal with the enormous expansion of the capabilities of individuals and autonomous units?
- How does this work when each unit or individual is seeking a unique solution to a problem?
- If working together requires cooperation and compatibility, how do we avoid excessive coordination costs?
- How should my organization stimulate local initiatives while balancing the needs for interoperability and standardization?
- How can information be shared when local operators prefer to avoid disruptive interventions from corporate staff or higher levels of management?
- How should our staff be encouraged to improvise short-term solutions while preserving the long-term benefits of a vast existing organizational knowledge?
- How should our organization establish responsibility and accountability for systems implementation when central control is impractical?

The answers to these questions will result in a new understanding of information governance and the rudiments of an information constitution. Of course, the choice of governance principles requires care and deliberation. Because people will have to commit to live by these principles, the politics of information governance must become the politics of open covenants that are openly negotiated, tolerant of diversity and respectful of staff morale. People, after all, are the only ones who can make information technology productive.

About the Author

Paul A. Strassmann's 40-year career in IS management has included posts as IS chief at General Foods, Kraft and Xerox. From 1991 to 1993, he was director of defense information for the U.S. Department of Defense. This article is based in part on his 1995 book, *The Politics of Information Management*, which is available from The Information Economics Press at (800) 800-0448. You can reach Strassmann on the Internet at questions@strassmann.com.





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Share battle shakes X terminal market

By Jeao S. Bozman

The world of X Window System terminals is in upheaval, as nearly all of the major vendors have scramhled for position in recent weeks by introducing new products.

With a flurry of introductioos, five of the Top 6 vendors tried to top ooe another with performance benchmarks in hopes that users would ootice their wares. The lone boldout was Digital Equipment Corp., which introduced its Multia multipurpose desktops last year.

Industry analysts said they are not surprised by the tough competitioo among systems vendors IBM, Hewlett-Packard Co. and Sun Microsystems, inc., along with independents sueh as Network Computing Devices, Inc. (NCD), Tektronix, Inc. and Human Designed Systems, Inc.

"It's kind of like a slot machine where the pictures line up across all the wiodows at once," said Greg Blatnik, vice president at X Business Group, Inc. in Fremont, Calif. Most vendors were due for an update of their existiog products, Blatnik said.

But some analysts said the competing offerings are a sign of slow growth in the $631 million worldwide X terminal marketplace. "It's really becoming obvious to the vendors that the market is growing mueh slower and that in order to grow, they have to take market share away from somebody else," said Jack Roberts, a senior analyst at Dataquest, Inc. in San Jose, Calif., who specializes in computer graphics and displays.

X terminals display applications that run on open systems servers. Users view applications using X-11 windowing technology developed by MIT and maintained by the X Coosortium, Inc. in Cambridge, Mass. X terminal users let central administrators maintain a small set of shared applications and data, and many end users do not store data files locally for security reasons.

Glad to see it

Users said they care little about the vendors' claims regarding the Xstones or Xmarks benchmarks for graphics display speeds that are performed under laboratory conditions. Because some of these benchmarks are not audited by independent sources before being published, many users prefer to benchmark their owo applications in compare X terminal performance.

But users said they welcome the vendor competition, which should keep prices low.

"It's cheap," said Tsvi Gal, a senior vice president of information technology at BankAmerica Corp. in Concord, Calif. "If you have a very limited amount of applications and you don't need to have any great intelligence on your desktop, then you can get X terminals for a very cheap price," he said. Good negotiators at large corporations can, he said, find discounts of 50% or higher for large orders, including hundreds of terminals.

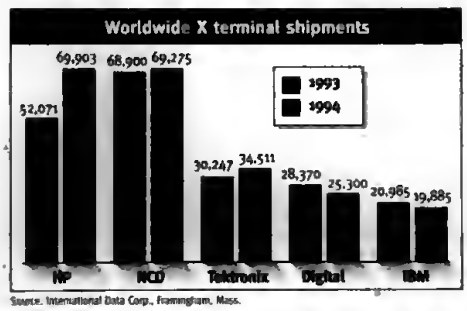
Prestigious customers

Large information systems organizations, including the New York Stock Exchaoge, have made hig commitments to install X terminals as a low-cost means of accessing centralized, secure applications (see story page 53). Customer service applications also spur X terminal use because end users can view multiple databases on several windows.

But PCs are nsed more often than X terminals to replace dumh terminnals — and at comparable prices. In addition, many users are installing $500 PC X software on desktop PCs instead of buying X terminal hardware, analysts said. At the same time, most Unix server vendors are providing better client/server links to Windows-based desktops. Some, such as Tektronix, already support Microsoft Corp. Windows NT servers.

Some vendors have underplayed their X terminal offerings and so have missed opportunities for sales growth, analysts said. IBM, for example, just updated a Motorola, Inc. 88000 unit it was selling last year with a PowerPC 603 chip (CW, Feb. 13). And Sun did not introduce its first X terminal until 1993. Earlier this month, it updated that offering with a MicroSPARC I chip rather than the faster MicroSPARC II shipped in Sun workstations.

From here on, some analysts predicted, vendors that take the X terminal market for granted may be bypassed as users shop for the best values.



Source: International Data Corp., Framingham, Mass.

Going beyond X

Fresh from its climb to the peak of the worldwide X terminal market, Hewlett-Packard has announced four new Envizex X terminals this month to round out its line of low-cost displays for client/server applications. The models perform 30% faster than the first models in the Envizex line, which was announced in late 1993.

Pricing for the Envizex P series X terminals, based on 33-MHz Intel Corp. 1960 RISC chips, ranges from $3,195 for a monochrome unit with a 19-in. display to $5,295 for a color unit with a 20-in. color display. All four units are shipping now, with optional floppy disk drives, audio options and Token Ring adapters, HP said. A new version of HP's Enware X server software, Version 5.3, will support a 100VG-AnyLAN fiber-optic link and an early version of the Open Software Foundation's Common Desktop Environment Unix graphical user interface software. However, Enware 5.3 is not slated to ship until summer, HP said.

Eileen O'Brien, director of terminals research at International Data Corp. in Framingham, Mass., said HP used focused marketing, competitive pricing and performance boosts to grab the No. 1 spot in the worldwide X terminals market last year (see chart). "HP has been very serious and aggressive about this market, and it's really paid off," O'Brien said.

HP sold 69,900 units last year, edging out former market leader Network Computing Devices in Mountain View, Calif. — *Jean S. Bozman*

Stock exchange

CONTINUED FROM PAGE 53

not to impose automation or specific functionality."

The X terminal screens now being installed on the floor are smaller than the TV-size terminals they replace, but they present a sharper image, Rosenhfatt said. "By looking at the screen as I enter the [trading] crowd [on the floor], I have an idea about what I anticipate the market will be." He said the trading-floor overhaul is essential to expanding the volume of daily trading.

Central administratioo of groups of Unix servers will allow a few IS staffers to quiekly install software updates from two sites in New York. in the event of failure due to a localized LAN problem, X terminals can be replaced and oew display software downloaded from the HP servers within several minutes. Eveu power failures and network outages can be limited through redundant system design, Kubat said. For the sake of redundancy and horsepower, up to 50 HP servers will be included in one network domain to support the two primary mission-critical applications. One of these applications, the NYSE's Electronic Book of trading, holds orders for stock sales at specific prices.

Unix watchdog

While the New York Stock Exchange has embraced Unix servers for its revamped trading floor, it uses Unix workstations to analyze irregularities in trading. Once flagged by NYSE mainframes, data on irregular trading patterns is sent to Sun Microsystems, Inc. Unix workstations for complex analysis, IS managers said.

Sun workstations have been used for NYSE surveillance since the late 1980s, and the combat-proven SunOS 4.1.3 applications are in no immediate danger of being replaced.

"The Sun SPARC Unix is stable enough to survive and not to be displaced by Hewlett-Packard [HP/UX] or [IBM's] AIX," said Bernard D. Dugan, SIAC vice president of surveillance and regulatory services for the exchange. "There's no major need for us to go to a completely different platform."

SIAC writes custom Unix surveillance applications in C and C++, said Mark Salem, director of software development for NYSE surveillance. One hundred NYSE analysts use a variety of Sun machines to look at trading history, account information and purchasers' identities, he said. But 400 PC users in the exchange's member firm regulation division use graphical user interface-based PowerBuilder applications from Powersoft, a unit of Sybase, Inc., to view a Sybase database on a separate Sun SPARC 10 Unix server.

IS managers continue to evaluate new technology, including Sun's forthcoming OpenStep object-oriented application development environment. But they will add technology only if it lends a real-world advantage. For example, SIAC plans to migrate from SunOS to the newer Solaris 2.x operating system some day. Still, Dugan said he would prefer to stick with current SunOS programs "as long as the applications work." — *Jean S. Bozman*

Standards war

Rival groups vie for standard-maker status

By Stephen P. Klett Jr. and Tim Ouellette

For a brief moment recently, it looked like a battle had been won in the all-out videoconferencing standards war, between the international Multimedia Teleconferencing Consortium (IMTC) and the Personal Conferencing Work Group (PCWG).

But Microsoft Corp.'s throwing its considerable bulk behind the IMTC-backed International Telecommunications Union (ITU) standards has only made the waters murkier.

The focus of the IMTC is to provide interoperability among videoconferencing products from different vendors using the H.320 and T.120 specifications.

The PCWG, which is unofficially led by Intel Corp., has a similar charter, but its specification is not interoperable with the H.320 or T.120 standards [CW, Jan. 23].

Most vendors — Intel included — are playing it safe by joining both groups.

Although analysts acknowledged that Microsoft's name would lend a great deal of clout to the IMTC, they downplayed the move as an affront to Intel.

"The message is not that Microsoft is saying, 'We'll only support H.320 to compete directly with [Intel]', they're just saying, 'We're coming out in support of standards,'" said Sarah Dickinson, program director and senior analyst at Personal Technology Research, Inc. in Waltham, Mass.

"Microsoft finally chose a standards group — so what?" said Alfred Riccomi, a management consultant at MultiMedia PC Systems in Richardson, Texas. "The marketplace will decide who's right based on their pocketbooks, and right now they're not buying from anyone."

According to Intel, there is no conflict between the groups, which it contends complement each other.

"We think [Microsoft's announcement] is great, and you'll be seeing more from Intel and Microsoft," said Mike Glancy, director of architecture and personal conferencing services at Intel in Hillsboro, Ore. "The PCWG has a broader focus in the entire area of personal communications. IMTC is more focused in conferencing. We think [IMTC's] T.120 portions are excellent solutions."

Making sense to Microsoft

Microsoft claims it chose the standards group that makes the most sense for it and its users and says it will not join the PCWG any time soon.

"I would say we'll not be joining the PCWG. We're joining the IMTC and the ITU," said Blake Irving, a group manager at Microsoft in Seattle. "Intel is an active member of the IMTC, and we have a great relationship with Intel. But there's no sense being in two separate committees addressing the same issue."

Out of the gate, Microsoft will focus on providing product support for data conferencing, which is the focus of the T.120 specification. However, such products will not appear until next year. Video- or H.320-compliant products will follow, Irving said.

Mary Brandel, Computerworld Client/Server Journal senior editor, contributed to this report.

[redacted]

DEK Software International has announced Hypershelf, on-line document management software developed by Virtual Media Technology Ltd. in Australia.

According to the Cherry Hill, N.J., firm, Hypershelf uses a bookshelf paradigm to index, locate and access WinHelp-based hypertext documents.

The product provides a task-oriented view of hypertext files and a parallel table of contents window that helps users navigate the document. Features include multiple document search capabilities and visual references such as page numbers, chapter headings and indexes.

Hypershelf costs $595 for 20 users and $1,895 for 100 users.

▶ *DEK Software*
(609) 424-0565

Symantec Corp. has announced Norton Disklock 3.5, access control software.

According to the Cupertino, Calif., company, Norton Disklock 3.5 requires 75% less memory than the previous version and has XMS memory support.

The product features three levels of security and comes in an administrator version for configuration and distribution across a network from a central location.

Norton Disklock 3.5 costs $89. The administrator version costs $700.

▶ *Symantec*
(408) 253-9600

Extended Systems has announced Pocket Printserver, Extendnet and Extendnet MPX, open systems print servers for Ethernet or Token Ring environments.

According to the Boise, Idaho, company, the Pocket Printserver was designed for single protocol, single printer environments.

Extendnet is a multiprotocol print server that connects two printers anywhere on a network, while Extendnet MPX connects up to four printers anywhere on a network.

Prices start at $299 for the Pocket Printserver. Prices range from $595 to $795 for Extendnet and $995 to $1,195 for Extendnet MPX, depending on the environment supported.

▶ *Extended Systems*
(208) 322-7800

EZPower Systems has announced PowerOffice 2.0, document management software.

According to the Philadelphia company, PowerOffice 2.0 can turn any existing SQL database, host application and Windows client/server application into an on-line document for viewing. It automatically reads in indexing information.

The product uses existing data relationships to provide relational views of electronic documents and incorporate workflow functionality.

Prices start at $995 per user, including the server.

▶ *EZPower Systems*
(215) 496-1700

Simplify Development Corp. has announced MailRoom for Windows 2.0.

According to the Nashua, N.H., company, MailRoom for Windows 2.0 lets users process paper documents electronically.

Users can receive, view, annotate and forward faxes using standard electronic-mail applications. The product converts fax server files as they are mailed to Tag Image File Format, compressing them to save storage space and network bandwidth.

The product supports numerous auto-feed scanners. MailRoom for Windows 2.0 costs $129 per user for a 10-user pack or $179 for a single-user version.

▶ *Simplify Development*
(603) 881-4450

Accton Technology Corp. has announced EtherHub-t6I and EtherHub-16MI, workgroup stackable hubs.

According to the San Jose, Calif., company, EtherHub-16I is a 16-port, multisegment 10Base-T hub that interconnects two to 17 workstations in a workgroup LAN.

EtherHub-t6MI provides the same features but also includes an onboard Simple Network Management Protocol (SNMP) agent that allows SNMP data to be shared throughout the LAN.

EtherHub-t6I costs $699, and EtherHub-t6MI costs $1,299.

▶ *Accton Technology*
(408) 452-8900

Apsylog, Inc. has announced PC Galaxy Suite 2.0, asset management software.

According to the Palo Alto, Calif., company, PC Galaxy Suite 2.0 integrates automatic LAN inventory, asset management and help desk functions.

The product inventories DOS and OS/2 PCs, Macintosh workstations, LAN servers and stand-alone PCs. Features include tracking of asset acquisition and warranty and maintenance information.

Prices start at $1,295 for a single-user version that manages up to 100 PCs.

▶ *Apsylog*
(415) 812-7700

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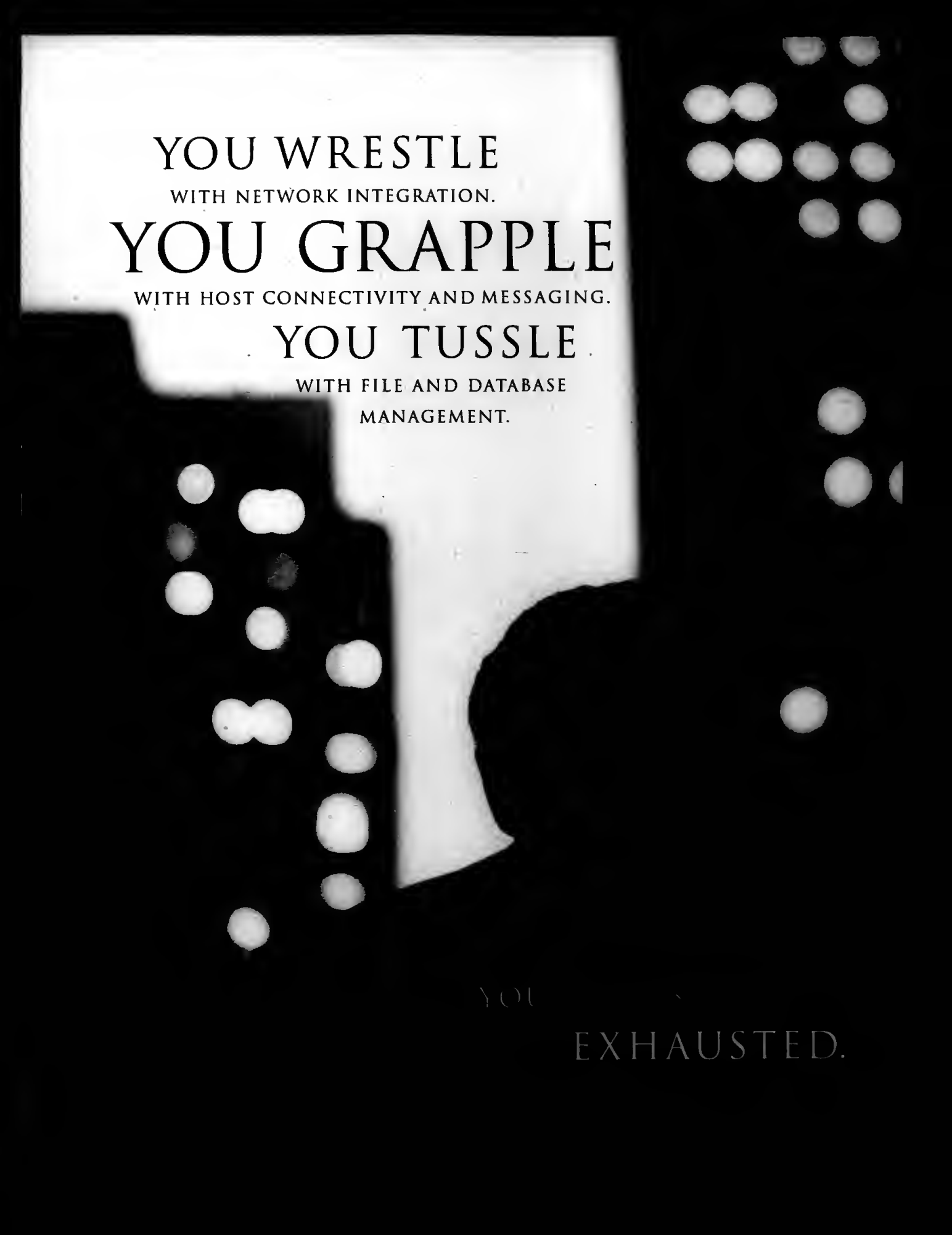
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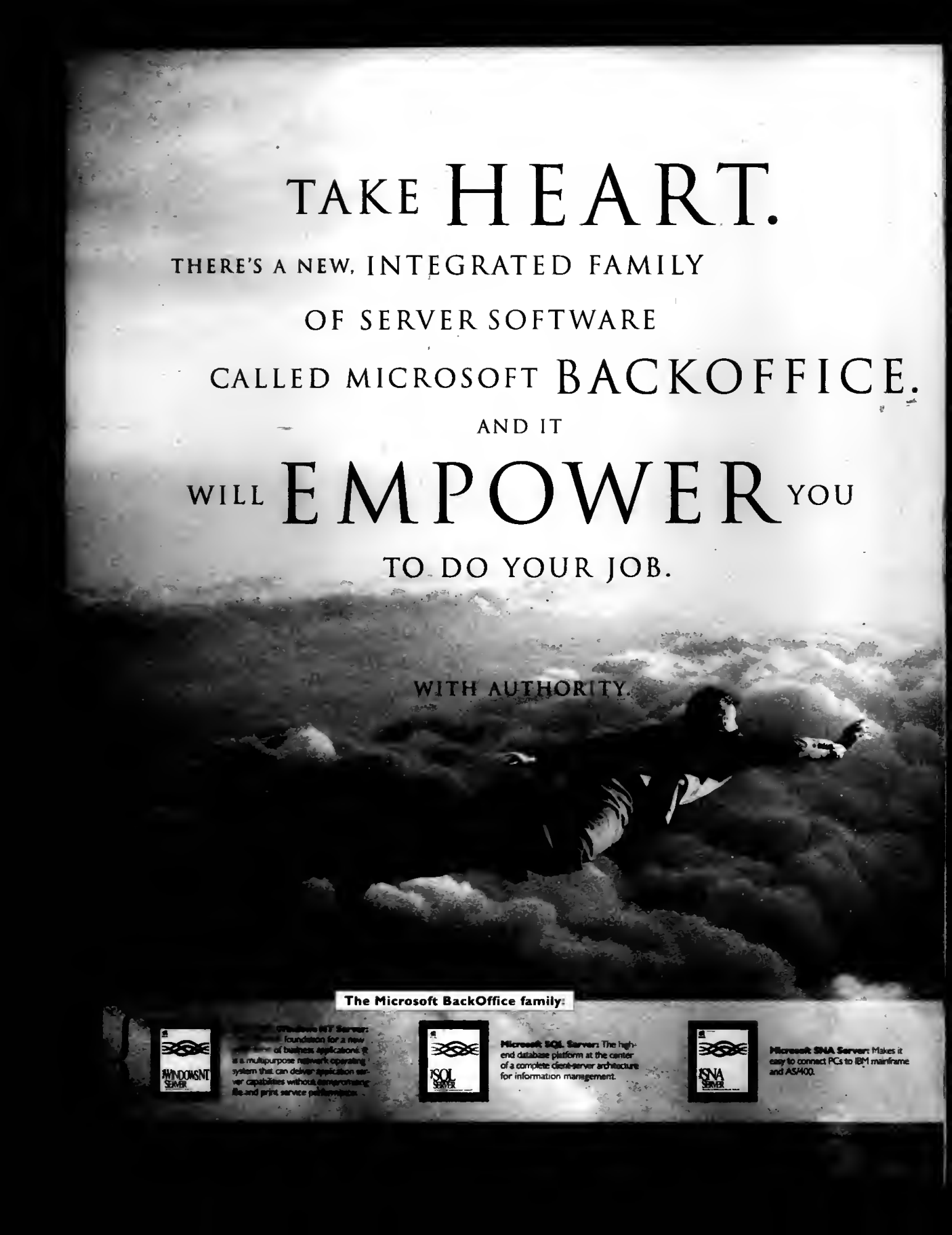
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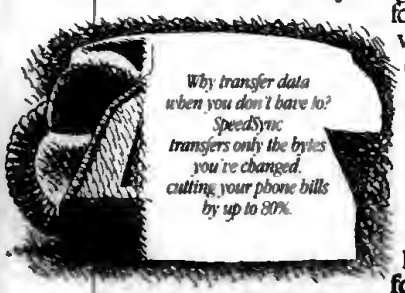
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PC Magazine, U.K. Oct. '94

"LapLink for Windows 6.0 is seriously good stuff. Recommended."
BYTE Magazine, Jan. '95

"If you use more than one computer, you need LapLink for Windows."
PC Computing, Nov. '94

"Installation is simple and the connections are easy to set up."
Windows Magazine Dec '94

Amex travels the 'net

By Thomas Hoffman and Ellis Booker

When American Express Co last month introduced ExpressNet, its foray into electronic interactive services over America Online, the announcement was greeted with mixed reviews.

Some pundits viewed ExpressNet as yet another vanillu offering being introduced into u promising hut infantile electronic commerce market.

But others said thut because of Amex's immense market presence and pragmutic upproach to electrooic commerce, the company may be setting a standard for other financial services players to follow.

"Electronic connections will become the deciding factor for banks as we know them today," said Richard Crone, senior manager of financiat services ut KPMG Peat Murwick in Los Angeles. "With the entrance of American Express into the electronic arena with America Online, the pressure is on for hanks to recognize tbe trends in consumer demand and compete on-line."

"I think it's going to take a while for this market to gel, hut American Express has taken u very practicat upproach" toward electronic commerce, said Bilt Bluestein, research director ut Forrester Research, tnc. in Cambridge, Mass.

Unlike the others

Unlike Visa International, tnc. und MasterCard International, Inc., which are readying transaction-processing systems for the Internet, Amex is providing its and AOL customers with cardholder and travel services over an established commercial network.

"All of these Internet efforts are in the experimental stage. American Express' effort, while far from earth-shattering, is u fuller effort directed at u specific audience," said Adam Schoenfeld, editorial director ut Jupiter Commnoications L.L.C., u new mediu and publishing firm in New York.

"Coosnmers are still not quite ready to conduct transactions over the Internet," Schoenfeld said.

Under ExpressNet, Amex cardholders und AOL's 1.5 million subscribers will be able to search for travel information across muttiple databases, including Fodor's Worldview, Frommer's Online Travel Service and *Travel & Leisure Magazine*. Amex cardholders requesting duta on their accounts can now access Amex data through AOL via X.25 connections.

Although AOL is uvailable today only in the U.S., Amex'u 36.3 million cardholders will be able to use the service arouod the world hy year's end beeause hy then AOL will have an internutional reach, according to an AOL spokeswoman. Currently several hundred thousand Amex cardholders subscribe to AOL, accnrding to David Bauman, vice president of husiness development and general manager of interactive services at the New York-based diversified travel and financial services giant.

Key services offered on ExpressNet

- Review details of American Express accounts, including billed and unbilled charges; download statements into personal finance software packages; pay Amex hills on-line.
- Make travel arrangements on-line, including air, rental car and hotel. This service, Express Reservations, will he availahle in March.
- Share husiness and travel tips with other ExpressNet users through on-line conference rooms and message boards.

Amex customers who want to access cardholder-only features — such as account queries and electronic bill payments — will receive secondary passwords for an extra layer of security in the network, Bauman said. Even though travelers have been making on-line reservations since the mid-1980s, ExpressNet will offer users some unique advantages, he added.

For example, by linking to the travel databases, ExpressNet users huve access to an exhaustive list nl destination information. Amex cardholders will be able to download their statements into personal financial programs such as Intuit, Inc.'s Quicken instead of keying the data.

Furthermore, ExpressNet users will be able to draw off specialized offers, such as frèe airline companion tickets and restaurant coupons, Bauman said.

Hard to predict

Bauman declined to project the additional revenue the company plans to derive from ExpressNet, which he described as minimal. However, he said the additional services being offered through ExpressNet will ultimately drive expanded use of the card and help fuel the company's revenue growth.

ExpressNet software for Macintoshes and Windows PCs is available for a limited time at no charge by calling (800) AXP-1234. The monthly fee for AOL is $8.95, which includes five free hours nf connect time. Additional AOL time is $2.95 per hour.



THIS WEEK, A SPECIAL ALL-INTERNET SECTION THAT INCLUDES:

INSIDE

- WHAT'S NEW ON THE 'NET, 65
- PACKAGE ALLOWS INTERNET USERS TO MAKE PHONE CALLS, 65
- NEW ELECTRONIC PAYMENT METHODS NEEDED, 66

Internet triggers virus debate, security measures

Providers dispute accountability for virus distribution

By Gary H. Anthes

Computer viruses don't harm people, people harm people.

That paraphrase of the famous gun lobby slogan sums up the views of many Internet access providers when it comes to dealing with virus code distributed from sites oo their networks.

While generally deploring any practice that spreads harmfut software, the service providers argue that virus code is not illegal per se. They also say it is neither feasible nor legally prudent to police the content of their networks.

That hands-off policy does not sit well with many users, who argue that an access provider should give a swift boot to any user trafficking io viruses.

"This is just to let you know that you have another user who is distrihuting viruses from your system," said Steven Hoke, an Internet user, in a recent message to Netcom On-Line Communications, Inc. io San Jose, Calif. "This type nf vandalism is dangerous to others...and

Virus, *page 66*

From: juangus@max.tiac.net (Bite size eats)
Newsgroups: alt.comp.virus
Subject: Mike.zip & asm code
Date: 20 Jan 1995
Organization: The Internet Access Co.

This is the assembly code for the dreaded Michelaogelo virus, followed by the uuencoded zipped binary form. Don't download this unless you ABSOLUTELY know what you are doing. I am not responsible for anything you do with the virus.

If you want to write me, I am at judas@infosoc.tiac.net. Don't reply to this site. Repost requests will be ignored.

judas

;Michelangelo
;Size: 512
;Type: Boot infector
(Virus code follows)



Unix groups reduce attack susceptibility

By Jean S. Bozman

Unix systems and network administrators are taking steps to prevent Internet attacks prompted by a recent "spoofing" incident at the University of California ut San Diego, according to users at several large sites.

Focusing on network routers as the first line of defense, these managers are changing router-configuration software to detect false IP addresses from the Internet. But they said it is eqnally important to ensure that Network File System (NFS) data files — stored on Unix servers — are not sent outside (see chart page 66).

At Purdue University's West Lafayette, Ind., campus, a Unix router was being configured last week to filter out "spoofing" attacks, said Dave Curry, manager of the Unix Systems Programming Group for tbe school's engineering computer network. For most routers, such as those from Cisco Systems, Inc. or Wellfleet Communications, Inc. — now Bay Networks, Inc. — "you can configure the router to refuse to pass those packets," he said. The Purdue router programming effort required only u few new lines of code, Curry said.

Following suit

Doug Eltoft, director of network operations for tbe University of Iowa'u Engineering College in Iowa City, said his group is doing the same thing. The engineering network has 2,000 user identifications for hundreds of Unix workstations and hundreds of Macintoshes.

The widespread publicity over

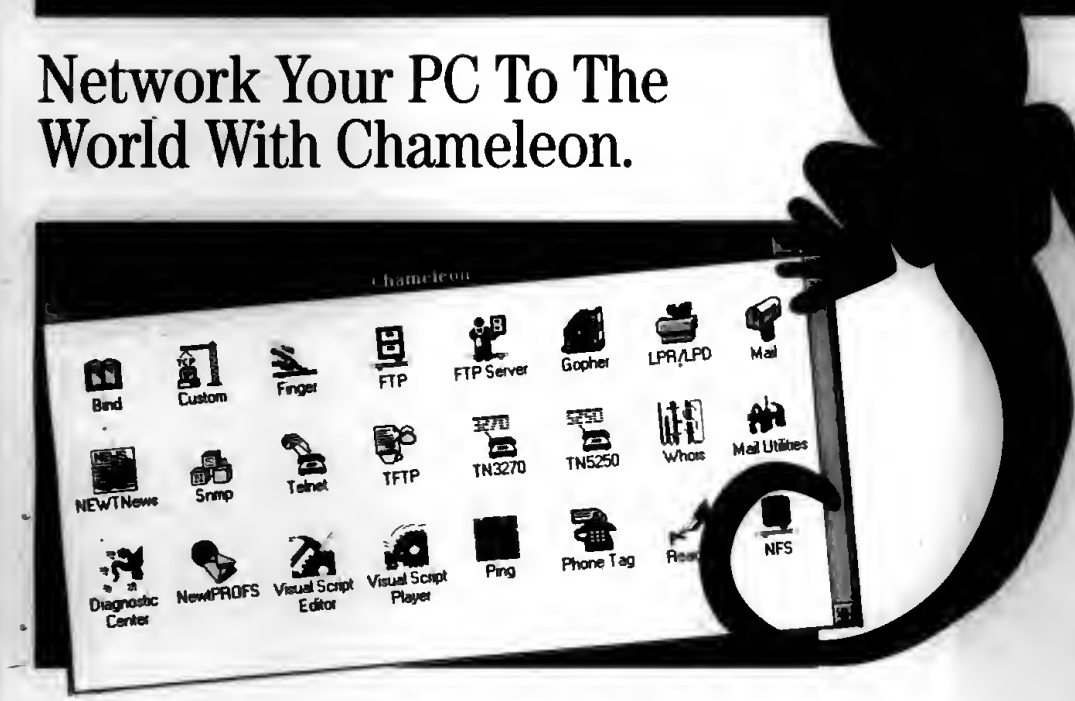
Security, *page 66*

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Chameleon includes more applications that allow you to access information on Unix, mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

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Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package. Send and retrieve email, download files, print documents, login to remote hosts, and run client/server applications. Connect your PC to the world with Chameleon.

NetManage Chameleon includes WinSock TCP/IP and is 100% DLL. Chameleon requires only 6KB memory and installs in just 5 minutes.

Sept. 1994 Sept 1994 Sept 1994

APPLICATIONS INCLUDED:

- Terminal Emulation
  - Telnet: VT100, VT200, TVI, TN3270, TN5250
  - Visual Script Editor & Player
- File Transfer
  - FTP Client & Server
  - TFTP
- File & Printer Sharing
  - NFS Client & Server
  - LPR/LPD
- Electronic Mail
  - SMTP Mail with MIME
  - Phone Tag
  - IBM PROFS
  - POP2, POP3, SMTP
- Internet Access
  - Gopher
  - Newsreader
  - Whois
- Network Utilities
  - Ping
  - Finger
  - Diagnostic Center/Trace Agent
  - ONS Client & Server
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Time to unweave the Web, explore the sites

A semiregular column with items of interest and amusement from the Internet.

This just in: Commercial domains on the Internet grew 25% in the fourth quarter and had a cumulative growth of 132% in 1994, according to figures released by the Internet Society in Reston, Va.

Moreover, companies are rapidly integrating their World-Wide Web pages with their normal marketing efforts. Take Intel Corp., for example. At the same hour that it was describing its next-generation P6 microprocessor at an international circuit conference in San Francisco two weeks ago, it was publishing a hypertext version of the presentation on its Web site.



Intel executives said this approach shaved weeks off the time it would take to disseminate a chip announcement around the world. Intel has had a Web page since last July and has just completed a three-month project to put information from all of its product groups on the corporate page. In March, a multimedia version of Intel's annual report will be available at the site (http://www.intel.com).

But while it is an adequate publishing/marketing platform, efforts are under way to make the Web more powerful and flexible.

■ Adobe Systems, Inc. in Mountain View, Calif., and Profound, Inc. in New York earlier this month announced a strategic relationship to deliver visually rich electronic documents on-line. Profound, a new subsidiary of Market Analysis and Information Database, Inc., said its on-line service will be the first to integrate Adobe's Acrobat reader into a user interface. The result will be a system that lets users download content that preserves its original fonts, graphics, illustrations and color.

New sites

■ Western Micro Technology, Inc. in Saratoga, Calif., launched DesignShop, a Web site containing electrical component/part information from more than 160 manufacturers. Users can search for and then request via a fax gateway technical documents, prices and availability. The site also supports on-line ordering. Contact http://www.westernmicro.com.

■ Motorola Corp.'s RISC Microprocessor Division in Austin, Texas, has built a Web presence for its PowerPC chip line. The PowerPC Web server includes upcoming events, hardware and software product fact sheets, technical white papers and on-line technical support. The site includes hyperlinks to Apple, IBM, Microsoft and Motorola. Contact http://www.mot.com/PowerPC/.

Just for fun

Hats off to Win Treese at Open Market, Inc. in Cambridge, Mass., for his Internet Index, a regular compilation of facts and figures from the Internet.

The latest index reported:

- Average time in minutes during business hours between registrations of new domains: 2.
- Number of Norwegian television shows with a Web home page: 1.
- Percentage of Estonian elementary and secondary schools connected to the Internet: 16%.
- Estimated number of readers of the rec.humor.funny Usenet newsgroup: 480,000.

To subscribe to future issues of the index, send a message saying "subscribe internet-index" in the body to internet-index-request@OpenMarket.com.

Tips and tricks

In the future, someone said, people will want "attitudes about information" rather than the information itself. Put another way, what you really want is a like-minded agent who can separate the wheat from the chaff, who can do the laborious searching and selecting of information for you. Computerized intelligent agents may handle this function eventually, but in the meantime, you can probably find a personal home page that does the same thing and can, in turn, act as your own "jump point" for 'net cruising. Besides, exploring personal pages is a fascinating experience in itself. For starters, connect to your local Internet access provider's home page and see if it contains a list of subscriber home pages.

Please keep us posted with your views, news and questions about items published in this space. Contact us electronically at ellis@cw.com.

—Ellis Booker

Internet Phone accepting calls

By Suruchi Mohan

You can now use the Internet to make telephone calls.

With Internet Phone software from VocalTec, Inc. in Northvale, N.J., you simply dial your regular Internet access provider to be automatically hooked up to speak to anyone in the world (see box).

But there are a couple of technological hitches. Because of a built-in time delay, the voice transmission can be choppy, and only one person can speak at a time. Also, the sound quality is not as good as that of a regular phone, users said.

Still, despite those issues, users said they are happy to be able to hold a long-distance conversation for the price of a local call, whatever the drawbacks.

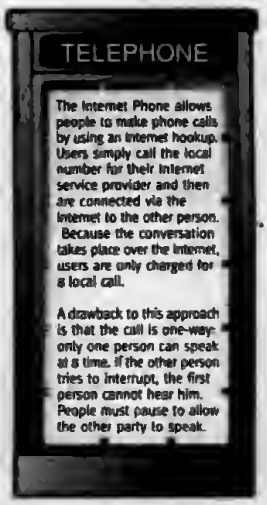
"It's pretty great," said Richard Haus, product marketing specialist at Industrial Devices Corp. in Novato, Calif. "I assumed I didn't have enough capacity to do voice, but it's pretty impressive."

Paul Grabowsky, a boiler mechanic at Finkelstein & Morgan in Scarsdale, N.Y., agreed, adding that sound quality depends on server quality. For example, he said, a connection to Hong Kong was clear, but one to Brazil was not.

The sound quality is not as good as that of a phone, Haus agreed. Additionally, the product lacks conferencing capabilities. Despite those limitations, he said, it is a good product.

Internet Phone is available now for users with a multimedia-enabled 33-MHz, 486-based PC. The introductory price is $49; after March 31, it will go to $99. Internet Phone is available in a kit containing software, a speakerphone with handset and a PC sound card for $349.

Jack Gold, a senior research analyst at Meta Group, Inc. in Stamford, Conn., said the product would first become popular with home users and then catch on with corporate America.



Techno-features

Internet Phone is interesting from several technological perspectives, Gold said. Among the impressive features are the low bandwidth requirements and that voice packets can be reconstructed if they are lost on the way.

A good compression algorithm is what allows voice — which requires more bandwidth than data — to travel easily over the Internet, he said. As for the voice packet reconstruction, Internet Phone allows for 5% to 10% of packets sent to be reconstructed, enough to reconstruct a phrase or sentence.

The company notes a transit delay of half a second on domestic calls and one second on international calls, which does inhibit smooth conversation.

Tom Gerhart, an engineering technician at Loral Advanced Simulation in Bellevue, Wash., said the delay was more like one second for domestic calls and four seconds for international calls. But, he said, he became used to the delay after using the Internet Phone for a few minutes.

Briefs

GTE Mobilnet picks Hughes

GTE Mobilnet has named Hughes Network Systems, Inc. its primary provider of Cellular Digital Packet Data (CDPD) network equipment. GTE Mobilnet, GTE Corp.'s cellular arm, said it would deploy CDPD in at least 10 markets this year.

Optical Data joins Defense

Optical Data Systems, Inc. in Richardson, Texas, said it will participate in a two-year, $300 million deal with Electronic Data Systems Corp. to provide the U.S. Department of Defense and other federal agencies with internetworking hardware.

DLSw spec approved

The APPN Implementers Workshop reached final approval on Version 1.0 of its Data Link Switching (DLSw) specification last month. The spec defines an industry standard for the interoperability of DLSw products. It does not, however, specify interoperability with existing DLSw products. Individual vendors may provide interoperability with these older implementations.

3Com buys ISDN developer

3Com Corp. in Santa Clara, Calif., has acquired Integrated Services Digital Network (ISDN) development partner Access Works Communications. The Holmdel, N.J., company sells the QuickAccess line of ISDN digital transmission products, which were designed to provide high-speed access to the Internet. The deal's value was not disclosed.

Bell Atlantic unveils services

Bell Atlantic Corp. in Philadelphia last month introduced network management services aimed at large users nationwide. The company's Large Business Services Division will offer router-to-router monitoring of wide-area networks as well as maintenance of wide-area links. Also, Bell Atlantic Network Integration will offer three sets of new services, including an Enterprise Network Management Service, Network Performance Engineering and Router Central router network support services.

Ravi Kalakota and
Andrew B. Whinston

Payment schemes needed

There are several business issues that current Internet mercantile schemes do not address. Among these are simplicity and speed.

At the moment, the simplest and most widely used methods to make purchases on the Internet are: to enclose credit-card numbers in an electronic-mail message or go off-line and use the telephone. Given the open nature of the Internet, the E-mail method is wide open for fraud.



To combat this, an increasing number of payment schemes based on cryptographic techniques are appearing on the Internet. These schemes are aimed at the issue of authentication (are you who you claim to be and is your payment valid?). These payment schemes come in two main types: electronic tokens and encrypted credit cards. Another payment scheme uses third-party processors and a phone call to establish authentication.

Buying process

A mercantile process scenario would likely take place as follows:

- Buyer and seller engage in a dialogue that identifies the product or service the buyer desires and offers a price quote. This dialogue might be interactive on-line or even off-line through an electronic catalog and telephone.
- The buyer then sends the seller the encrypted credit-card number or a certain number of electronic tokens. The seller gives its payment service information about the buyer, the product or service and the agreed upon price and asks for a funds transfer.
- The seller's payment service authenticates the transaction and the buyer by calling that buyer or using the digital signature method, which does not require interaction.
- The seller's payment service identifies the buyer's payment scheme and sends a standardized message giving details of the transaction so the buyer's account is properly debited or charged.
- The seller is notified of the completed financial transaction. The seller then dispatches the goods or, if the buyer is purchasing information, the seller provides a key to unlock a file.
- At the end of the billing cycle, the buyer receives a list of transactions. The buyer can then deny certain transactions or complain about overbilling. Suitable audit or customer service actions are then initiated depending on the payment scheme.

The above process is similar to the way credit-card transactions are processed. While the process appears to be technically sound, it may not meet certain "hidden" criteria needed for successful business practice.

For instance, take simplicity. Let's face the facts: Typical customers such as Aunt Sally or Uncle Bob are technophobes, and if they have to muck around with public keys, private keys and key management, they will abandon commerce on the Internet.

This issue will have to be addressed with user interfaces that are intuitive and hide the complexity of the underlying technology.

Another issue transaction speed. This has not been addressed. Payment schemes need to be sophisticated enough to happen in near-real time.

Studies have shown that most of us do not have the patience to wait 20 seconds while a hyperlink is being processed by the server. Most cryptographic methods will take some finite time to process. Add other layers of processing and there is a long wait.

One payment plan

Finally, a vendor must decide which payment scheme to choose. If vendors sign up for only one of these schemes, then buyers will have to join several in order to do business with several vendors. It would be good if buyers need join only one service. Some vendors will be small so this appears unlikely.

So, we can expect several competing schemes simultaneously — making interoperable electronic commerce a necessity. It would be extremely valuable to the future of electronic commerce if vendors and buyers each join only one scheme of their choice.

Obviously, the time to address these issues is now — before we get to a situation where we have several "islands of electronic commerce."

Kalakota is a research associate and Whinston is a chair professor of IS at the University of Texas at Austin. Their book, *"The Frontiers of Electronic Commerce"* is scheduled to be published by Addison-Wesley in the spring.

Unix groups seek security

CONTINUED FROM PAGE 63

the University of California's spoofing attack [CW, Jan. 30] may spur more attacks, even by inexperienced hackers. The spoofing technique works by having a machine outside a site's TCP/IP network adopt an internal IP address — one copied from Internet data packets. That way the outside computer is trusted by the site's server.

CERTified answers

The national Computer Emergency Response Team, in an attempt to foil hackers, made safety recommendations last month. These and other countermeasures can prevent many problems, but not everything can be secured, users said. For example, any hacker on the Internet may stumble into a Unix server.

"It's possible to get to the point where you're going to keep out the bozos," Curry said. "They're getting prebuilt tools and running them. We've seen people break into Unix machines and start typing DOS commands. They don't even know what they've broken into." Many hackers use PCs running Windows, not Unix, he said.

Users say housekeeping is often underrated. "We are very strong believers in the idea that good system administration is your first line of defense," said Dave Gruhn, computer security manager at Lawrence Livermore National Laboratory in Livermore, Calif.

Network security steps for Unix systems administrators

1. Secure your Unix operating system right out of the box.
2. Program router software to refuse in-house IP addresses coming from the Internet.
3. Install Internet firewall software.
4. Audit Internet traffic.
5. Keep current with vendor security patches.
6. Watch password housekeeping procedures.
7. Put mission-critical data on client machines or secured servers rather than Internet servers.

Gruhn said administrators should be familiar with their site's user IDs, with patterns in disk-memory use and daily log-on times.

Weigh your choices

There are operational trade-offs to most security steps, users warned. Encrypting all data traffic is too costly, and even the router changes have a downside. "You're talking another 20% performance slowdown if you're taking all the packets apart and looking at them," Eltoft said.

Users can choose to turn some services off, such as the widely used Telnet communications program, said Randy Butler, technical program manager for networking and security at the National Center for Supercomputing Applications in Champaign-Urbana, Ill.

"That's the whole game in security," he said. "It's risks vs. the services that you need."

Virus

CONTINUED FROM PAGE 63

should not be happening on the Internet."

Netcom said, "We allow users to make any and all legal data available from their FTP sites or Usenet. This may include viruses.... The material is not owned or maintained by Netcom, and we do not endorse its distribution."

Two recent cases have brought the issue to a head. In one, a user going by the pseudonym "Digital Justice" set up on Netcom's service an anonymous file-transfer protocol (FTP) site called "INFES-Station BBS" that was allegedly intended to distribute virus code.

In the other case, someone called "Judas" broadcast viruses to subscribers of two Internet newsgroups (see chart page 63).

Judas "still has an active account with us," said Chris Woods, director of leased line services at The Internet Access Co. in Bedford, Mass. "We have gone over the legality of this, and it doesn't appear anything illegal has happened."

In an electronic-mail message to *Computerworld*, Judas said he posted viruses to Internet bulletin boards to give "fair distribution of code to everybody, not just antivirus people or those who are out to do damage to other computers and their users."

Robert Hall, president of Internet Access, Inc. in Nepean, Ontario, said he would take action against any customer known to be using the network for illegal purposes. "But [Judas] really hasn't, in my mind, done anything malicious," Hall said. "He's basically said, 'Here's the source code for the virus. This is information you'd need to write a virus checker.' If he'd wanted to do something malicious, he could have called it something like, 'New Game: download and try.'"

Hall said Internet access providers feel they must avoid policing content. Otherwise, a court or jury might deem them "publishers," with potential liability for anything — such as viruses, child pornography or libel — that slips through.

Protected right?

Although virus enthusiasts sometimes argue that distribution of their work is a free-speech right, not all users buy that argument. "For every voice I hear shouting that viruses are OK, there seem to be 20 other voices saying, 'not in my backyard,'" said Paul Ducklin at the CSIR Computer Virus Laboratory in Pretoria, South Africa. "And the 'net is everybody's backyard."

Ducklin said users should apply peer pressure to make virus writers behave. "Mandating viruses off the 'net is not the solution," he said. "If you're a real user and you would rather not have viruses around, say so!"

Other users said the transnational nature of the Internet compounds the problem. "We succeeded to convince the German news server not to carry the news group alt.comp.virus, but it is freely available from other news servers and we can't do anything to stop it," said Vesselin Bontchev at the Virus Test Center at the University of Hamburg.

"We are not going to flame a chemist because a junkie broke into his office to get drugs," said Gerard Manning, a virus consultant at the French Computer Crime Research Center. "Are we going to do the same against a pump attendant because he sells some gas and it is very easy to set fire to a house with gas? Surely not."

Frye Computer Systems, Inc. has announced Suds Wide Area Server Update Program (Sudssrv) 1.0, software that automates software distribution and file updating for file servers on a wide-area network.

According to the Boston company, Sudssrv 1.0 lets users create procedures at one file server for automatic distribution to servers on a Novell, Inc. NetWare LAN. The product can automatically update NetWare Loadable Modules, run console commands or update .INI files. Reporting features and a custom report writer are included.

Sudssrv 1.0 costs $595 for two servers and $395 for each additional server.

▶ *Frye Computer Systems*
(617) 451-5400

Wall Data, Inc. has announced Rumba Office for TCP/IP Networks, Windows software that integrates access to TCP/IP hosts or servers with access to mainframes, midrange and Unix systems and the Internet.

According to the Kirkland, Wash., company, Rumba Office for TCP/IP Networks includes a virtual device driver, a TCP/IP MultiNet stack from TGV, Inc., a Rumba File Manager and Internet access tools.

Internet tools include a World-Wide Web browser, a newsreader, gopher server access and electronic mail. Productivity features include a tool bar, hot spots and QuickSteps customizable templates.

Rumba Office for TCP/IP Networks costs $400 for a single user.

▶ *Wall Data*
(206) 814-9255

Xylogics, Inc. has announced Remote Annex 2000 and Remote Annex 4000, stand-alone remote access servers.

According to the Burlington, Mass., company, Remote Annex 2000 and 4000 provide mobile users with multiprotocol, enterprisewide remote access to corporate LANs and provide LAN-to-LAN routing capabilities.

Remote Annex 2000 provides 8 or 16 ports; it was designed for departmental networks. Remote Annex 4000 expands from 18 to 72 ports and was designed for enterprise networks.

Prices start at $2,695 for Remote Access 2000 and $4,795 for Remote Access 4000.

▶ *Xylogics*
(617) 272-8140

Racal-Datacom, Inc. has announced Excalibur Access Node (EAN) 4200 and 4400, frame-relay access nodes.

According to the Sunrise, Fla., firm, EAN 4200 and 4400 let users combine legacy, frame-relay and LAN protocols and WAN applications under one platform when integrated with Racal's network management products.

EAN 4200 is a single-protocol platform for remote branch locations. EAN 4400 is a multiprotocol platform for higher traffic, high-speed requirements, which include interfaces for Token Ring or Ethernet LANs.

Prices start at $2,475 for EAN 4200 and $3,115 for EAN 4400.

▶ *Racal-Datacom*
(305) 846-1601

Liebert Corp. has announced SiteNet Integrator, a communications system.

According to the Columbus, Ohio, firm, SiteNet Integrator adds network support and protection devices to the network management platform for centralized management.

Users can control uninterruptible power supplies and environmental control systems and monitor up to 10 other network protection systems. More than 100 variables can be chosen from nine diagnostic groups.

SiteNet Integrator costs $2,073.

▶ *Liebert*
(614) 888-0246



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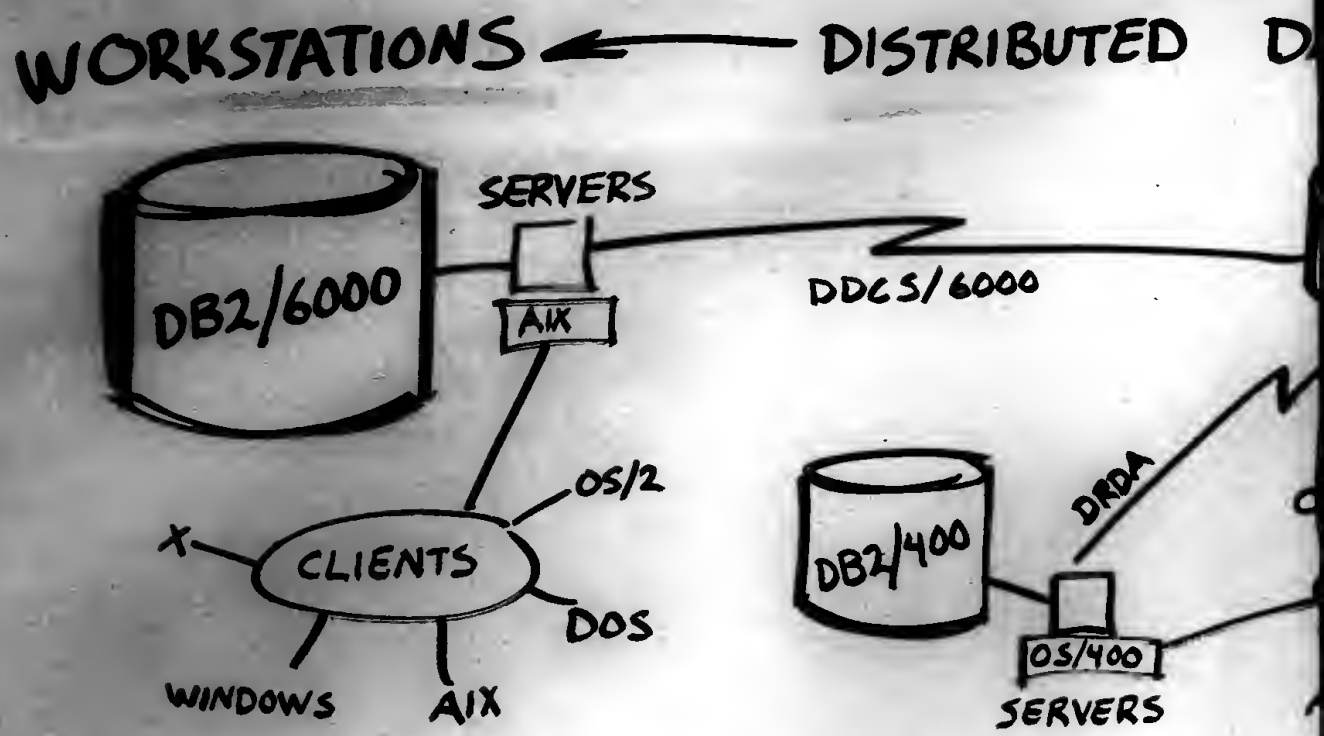
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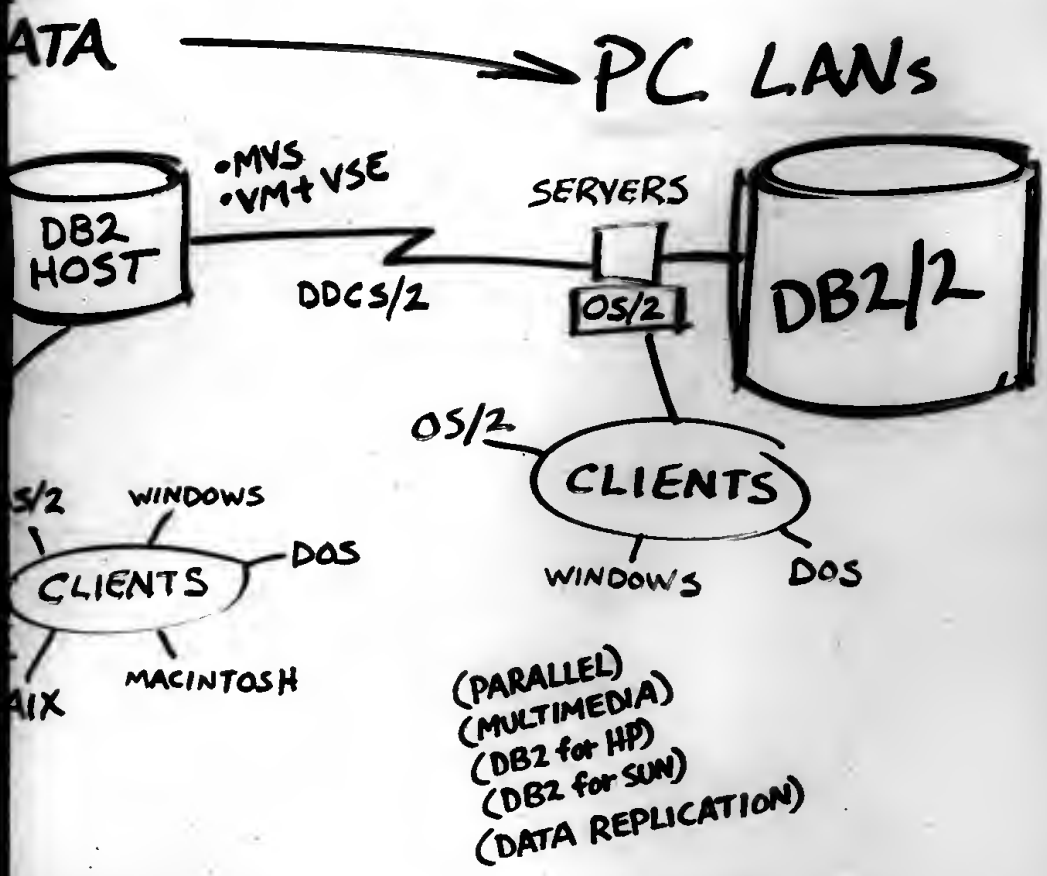
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Bull battles back with Jupiter debut

By Neal Weinberg

In a bid to keep mainframe customers in its orbit, Groupe Bull has launched a project, code-named Jupiter, to develop large mainframe systems based on CMOS technology.

Defying the downsizing trend, Bull is trying to give its installed base a clear reason to stick with the company by offering the latest in mainframe technology, which IBM already provides.

Developed with longtime technology partner NEC Corp., the new systems will be based on Bull's GCOS 8 operating system and its Distributed Processing System (DPS) architecture.

A new planet

Bull's mainframe, code-named Jupiter, will look something like this:

Operating system:	GCOS 8
Processor:	CMOS
Simultaneous sessions:	50,000
Transactions per second	1,500
Availability:	1997

Users responded favorably to the company's commitment to modernizing its mainframe fleet.

"From my perspective, I think it's great," said Bill Bowman, information systems manager at RMO, Inc. in Denver and president of the Bull Users Society. "Now they're starting to spread their wings and get back into the marketplace after kind of getting entrenched."

Bull, which is essentially owned by the French government, has undergone its share of organizational and financial upheaval in the past few years. But the company, whose U.S. operations are based in Billerica, Mass., reported last week that last year was its first year of operating profit since 1989.

Bowman added that mainframes are showing a resurgence in the marketplace as companies harness them up as database servers.

Not everyone is showing patience with Bull, however. The state of Arizona's health services department is ditching its Bull mainframe altogether and switching to a Unix system from Sun Microsystems, Inc., said IS manager John Smalling.

Smalling said a number of factors went into the decision, including the desire to move to Unix and dissatisfaction with Bull's support. Also, Smalling said, "We had a long-term concern about whether they're going to stay in business."

In their corner

But many of Bull's customers are remaining loyal. Gerald Karasinski, director of IS at Zantop International Airline, an air cargo company based in Ipsilanti, Mich., said he has been a customer since 1963, when the company was Honeywell, Inc.

"I'm pleased that Bull is staying around," said Karasinski, who uses a DPS 7000 for inventory control. He said he has no immediate upgrade plans but has no intention of hailing out, either.

Charles Burns, a research director at Gartner Group, Inc. in Stamford, Conn., said Bull currently has "some of the fastest large mainframes on the market for commercial workloads."

With Jupiter, the company is trying to produce cheaper machines by switching to the CMOS microprocessor. Burns said the Jupiter line "will sell automatically for current customers. But for them to really grow, they have to get into the mode of winning new business or starting to sell more comprehensively in the client/server environment — winning new business in existing customers."

Burns said Bull faces "a formidable task" scoring wins outside the installed base, and even with excellent software to support a distributed computing model that includes the mainframe, the marketing team seems to be having a tough time.

However, Bob Jernstadt, IS manager at X-Rite, Inc. in Grand Rapids, Mich., said Bull provided solid hardware and software support last year when X-Rite integrated Unix boxes into a network anchored by a Bull DPS 7000.

Joe Alexander, director of product planning and management for the GCOS product line, said Bull will handle the design and manufacturing of Jupiter, while NEC will get in on the sales end.

Platinum's new frontier

Database tools maker looks to enterprise systems arena

By Craig Stedman

Platinum Technology, Inc. does not want to do just databases anymore. After eight years of toiling quietly in the mainframe database tools market, Platinum is cobbling together a full framework for providing enterprise systems management across networks of MVS and Unix systems.

Based in Oakbrook Terrace, Ill., Platinum has gone on a buying spree in the past six months to start building up a portfolio of Unix management products (see chart). In the most recent deal, announced last week, the company bought BrownStone Solutions, Inc., a New York-based repository developer.

Platinum plans to use BrownStone's technology as the base for a central object repository that would store so-called "metadata" on a customer's application and business processes. The data would be used to kick off management tasks from a single-point-of-control console that Platinum is developing.

More on the way

Besides database administration, functions supported under the Platinum Open Enterprise Management System framework will include job scheduling, help desk, software distribution, security and storage management. A rough version of the framework should be ready by year's end, Platinum executives said.

Platinum has shared the mainframe database tools orbit with BMC Software, Inc. But the framework plan puts it on a trajectory to compete on a wider basis with vendors such as Computer Associates International, Inc., Legent Corp. and Tivoli Systems, Inc., said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

"This is a bit of a stretch for them," Mason said. "They have to convince people that they're a serious player in the general systems management market as opposed to just the database portion. We'll see if they're biting off more than they can chew."

Chris Foot, an assistant vice president and client/server database administrator at Mellon Bank NA in Pittsburgh, said Platinum will have to change its customer approach "because they just don't market to us anymore. They're going to have their fingers in the entire pie."

Mellon has had good results with Platinum's database tools, and the Unix technology that the company has bought "looks to be first rate," Foot said. The promised repository sounds "extremely useful," and having a single console to manage both MVS and Unix environments will be another plus, he added.

Platinum will likely be added to the list of systems management platforms that Mellon is looking at for a possible purchase later this year, Foot said. However, he added that the buying decision will involve multiple departments at the bank, "so I'm not sure how Platinum's plan will affect us."

Paul Humenansky, chief operating officer at Platinum, said he expects to make additional acquisitions by midyear that will add Unix help desk, security and storage management products to the company's mix. On the MVS side, Platinum will rely on interfaces to entrenched job scheduling and security products rather than develop or buy a solution, he added.

While the console and repository should be ready for shipment later this year, it will likely take two years "to get this all working like a Porsche," Humenansky said. "Maturity has to take its time with some of this stuff. There's no way around that."

Platinum's proposed framework is closest in concept to Legent's Cross Platform Environment (XPE) because both address MVS as well as Unix, Mason noted. However, Legent does not have the unified interface Platinum is promising, and XPE is oriented to the help desk rather than the systems administrator, he said. The repository is also a new twist for Platinum.

OpenVision Technologies, Inc. has run into development snags in trying a similar approach of taking Unix products from different vendors and integrating them into a framework. However, Platinum appears to be more technically savvy, Mason said. "OpenVision thought all it had to do was put a big wrapper around everything."

All in the family

Software developers that Platinum Technology has acquired as it moves to set up an enterprise systems management framework include the following:

COMPANY	PRODUCT(S)
BrownStone Solutions, Inc. New York	Repository and data dictionary
ViaTech Development, Inc. Bloomington, Minn.	Unix software distribution tools
AutoSystems Corp. Boulder, Colo.	Job scheduler for Unix systems
Aston Brooke Corp. Plymouth Meeting, Pa.	Database performance management tools
Dimeric Development Corp. Woodland Hills, Calif.	Oracle database administration software

New tack

In addition to creating its own management framework, Platinum said it will continue to enable its products to work with Tivoli Systems' TME Architecture under a deal signed last summer. The various products being integrated by Platinum will also be marketed on a stand-alone basis outside the framework.

Users put DCE projects on front burner

By Steve Moore
SAN DIEGO

■ Users at the recent Decorum conference here said they are ready to put the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) to work this year. Yet they also said they are struggling to fit together complex DCE middleware and fill in missing pieces such as those required to link DCE applications with network management platforms.

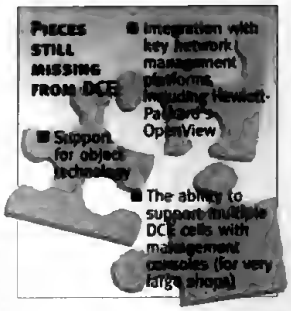
At the conference, which attracted more than 700 attendees, users said they especially need DCE middleware because it masks differences between operating systems, hardware platforms and file systems in multivendor computing environments.

With DCE, a single log-on enables any end user to reach data on any desktop, midrange or mainframe DCE server without knowing where it is located or how to navigate to it.

"We're done piloting, and we have several DCE projects due to go into production in 1995," said Anita Salinas, lead technologist at Citicorp North America, Inc. in Westlake, Texas. Salinas uses DCE-based Encina online transaction processing applications from IBM-owned Transarc Corp. in Pittsburgh.

Salinas said, however, that there is still a lack of DCE systems management tools. "We want to integrate DCE and Encina with HP's OpenView Operations Center to handle systems management," she said, adding that Hewlett-Packard Co. has no tools available for that right now.

But the vendor is working on it. "You will see DCE management services built into the System Administration Manager utilities that ship with our operating system, and those tools will be integrated with our OpenView process centers, including Operations Center," said Gordon MacKinney, OpenView program manager at HP. He declined to say when that integration will occur, however.



Help is on the way

Last October, IBM shipped DCE Manager for AIX, which allows NetView/6000 users to access DCE services, said John Milburn, distributed computing marketing manager at IBM's networking software division.

Milburn said IBM is working through the OSF to help define a standard Simple Network Management Protocol (SNMP) management information base for DCE services. That SNMP base "is now in the works and will be in a future release of OSF's DCE," he said.

Users also asked for support of object technology in DCE. "We need an Object Request Broker on top of DCE," said Jeff Chittenden, vice president and enterprise architect at J. P. Morgan, Inc. in New York. "It's happening, but a lot more slowly than I would like."

Without an object-oriented version of Encina, Salinas said, it is difficult to pass objects over the network among Citicorp's object-oriented Unix servers.

Chittenden advised DCE users to develop a "just-in-time architecture" that takes advantage of technology "that your staff is capable of using in the near future and that is available from vendors in the near [term]."

Users and analysts voiced differing opinions on another DCE issue. "The ability to administer [DCE applications] across multiple cells is one of the biggest hurdles to DCE being deployed," said Nill Young, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

However, Michael Beddingfield, manager of computing administration at Exxon Production Research Co. in Houston, said most users will need only a single cell, so the lack of cross-cell administration capabilities is a concern only in the largest DCE implementations. In Exxon's case, a single cell will serve the Houston research division, but multiple cells will be needed as DCE is deployed throughout the company, he said.

Applications

Sybase teams up to join client/server race

PeopleSoft, Avalon Software sign with firm

By Kim S. Nash

Sybase, Inc. wants in on the exploding client/server applications market. But unlike rival Oracle Corp., Sybase will not build such packages itself.

Instead, the Emeryville, Calif.-based database maker said next month it will announce tight partnerships with selected financial, manufacturing and other applications makers in a bid to push packages that support Sybase's System 10 and upcoming System 11 databases.

Helping hand

Key to the new effort, said David Sohm, Sybase's vice president of channels and partner marketing, is a "more proactive" approach to providing engineering help to its partners seeking to port applications to Sybase's database. Currently, Sybase provides such hands-on help only in special cases and only at the request of the partner.

PeopleSoft, Inc., for example, worked out a deal with Sybase last year when it had trouble porting its financial applications to System 10. Sybase plans to be more proactive with partners "rather than waiting for them to come to us and say, 'Could you help us with this problem?'" Sohm said.

PeopleSoft, a financials firm in Walnut Creek, Calif., and Avalon Software, Inc., a manufacturing software company in Tucson, Ariz., are among the client/server companies that have signed on to the new, as-yet-unnamed program, spokesmen from the companies confirmed. Platinum Software Corp. in Irvine, Calif., and Dun & Bradstreet Software in Atlanta are also expected to participate.

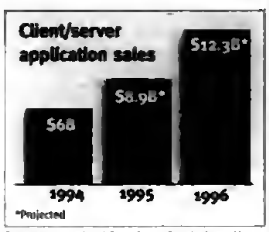
Middleman

Unisys Corp. plans to announce this week a deal to resell Oracle's financial applications and database to banks, insurance firms and other financial users.

Sybase needs to consolidate such support, given that the two leading client/server applications vendors support rival databases, said a source at one of Sybase's new partner firms. Applications from SAP AG run on Oracle and Informix Software, Inc. databases, while Oracle relies on its own database.

Slow to react

"Financials and human resources and all the other applications like that can be a significant avenue of sales for a database. [Sybase] should have done this a lot sooner," said Herb Edelstein, an analyst at Euclid Associates, a consulting firm in Potomac, Md.



Source: International Data Corp., Framingham, Mass.

Indeed, Informix has gained 275 new customers since SAP ported its R/3 applications to Informix On-Line last year, according to Informix's 1994 year-end financial report.

Separate from the new program, SAP and Sybase have begun porting R/3 to the System 10 database, Sohm confirmed. He declined to estimate a delivery date.

Sybase has also signed on major systems integrators such as Electronic Data Systems Corp. and Price Waterhouse to jointly market Sybase-based accounting and other modules to users in specific vertical markets such as oil and gas, Sohm said.

Senior editor Rosemary Cafasso contributed to this report.

Briefs

Thinking Machines revamps

Thinking Machines Corp. filed a reorganization plan aimed at emerging from Chapter 11 bankruptcy protection. The Cambridge, Mass., company, which has stopped developing its massively parallel processors and is now focusing on software, also named Robert Doretti as its president and chief executive officer.

Unisys signs $4.2M pact

Oman International Bank, with $266 million in assets in the Sultanate of Oman, has signed a $4.2 million contract with Unisys Corp. for the Blue Bell, Pa., computer maker's Unisys Financial Business Architecture Navigator retail software.

Mainframe emigrants sought

The Antares Alliance Group and Hewlett-Packard Co. last week disclosed a deal to jointly pursue customers looking to move applications from mainframes to distributed client/server environments. Antares, a Dallas-based joint venture between Amdahl Corp. and Electronic Data Systems Corp., announced that its Huron 2.0 client/server software is now available for workstations and servers running HP/UX. HP will promote Huron as part of its Mainframe Alternatives program and will use Huron at its Open Systems Transition Center in Dallas, where it provides consulting services to customers.

StorageTek CFO moves on

A week after reporting disappointing fourth-quarter results, Storage Technology Corp. in Louisville, Colo., shifted its chief financial officer to "special assignment status." StorageTek said Gregory Tynn will now focus on corporate development projects and its leasing subsidiary. Named to replace Tynn as CFO was David Lacey, who had been company controller.

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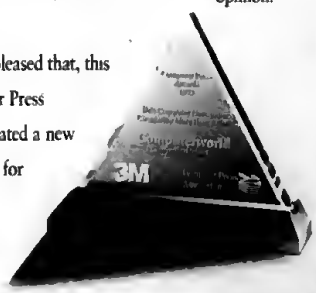
Nearly all editorial awards are decided by committees of experts who sit and review entries and use their best judgment to decide which publication or article is best. There is nothing wrong with this process — and it has certainly produced many awards for *Computerworld* — but, frankly, the opinions of our readers are more important to me than the opinions of experts. It is readers, after all, who are best able to judge the quality and usefulness of the material they read. And it is readers — not experts — for whom we write.

So I am very pleased that, this year, The Computer Press Association has created a new category of awards for their Tenth Annual Computer Press Awards: "The CPA Reader-Chosen Awards." These awards will be decided by the votes of publication readers. It is your chance to make your opinions count. I, for one, will be very interested in what you have to say.

To make your voting easy, we have provided a copy of the official ballot. You can fill it out, fax it in, or drop it in the mail.

However you do it, I encourage you to vote. The computer publication editors of America are waiting to hear your opinion!

Bill Laberis
Editor in Chief



Tenth Annual Computer Press Awards, 1995

The Computer Press Awards, co-sponsored by 3M Data Storage Products and the Computer Press Association (CPA), honor the top journalists who excel in their coverage of information technology. As the oldest and most coveted honor of its kind, the CPA provides a forum for technology journalists to be recognized by their peers.

COMPUTERWORLD

These are the stories we have submitted for review by the CPA. Please feel free to nominate these, or any other articles you've enjoyed during the year.

Instructional or Educational Articles or Series

- Guide to PC Support; *Kevin Burden, Stephan Clancy, Robert Johnson* (Dec. 5th)
- Guide to E-Mail; *Avery Jenkins, David Marshak* (Oct. 24th)
- Guide to 32-bit Operating Systems; *Jonathan Eunice, Mike Sullivan-Trainor, Garret Ray* (Apr. 11th)
- VIRUS; *Phillip Zakas* (July 11th)
- Software Product Review: Test Drive; *Jeff Angus, Al Giovetti* (Nov. 14th)
- Software Product Review: Test Drive; *Garret Ray* (Dec. 12th)

Features or Reviews

- High Tech Wagering: Jackpot or Jeopardy; *Joe Maglitta* (Feb. 7th)
- Gays at Home in High Tech; *Ellis Booker* (Sept. 26th)
- Demonstrating Value of Technology; *Alice LaPlante* (August 15th, Oct. 3rd, Oct. 31st)
- Is COBOL Dead? *Alan Pursell, John Cunningham* (April 25th)
- Decree: Deal or Dodge? *Stuart Johnston, Mitch Betts* (July 25th)
- Migration Costs Stoke User Anger; *Rosemary Cafasso* (May 16th)





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[redacted]

Software Moguls, Inc. has announced SM-arch, backup and retrieval software for Microsoft Corp.'s Windows NT and Novell, Inc.'s NetWare 3.12.

According to the Minnetonka, Minn., company, SM-arch for Windows NT handles special files and provides an applet for viewing and controlling backup service.

SM-arch for NetWare 3.12 supports backup of binary files, includes NetWare-specific file system attributes and provides permission for files and directories.

SM-arch for Windows NT costs $250 per client and $2,000 per server. SM-arch for NetWare 3.12 costs $250 per client.

▶ *Software Moguls*
(612) 933-8790

WorksRight Software, Inc. has announced Case Manager 1.0 for the IBM AS/400.

According to the Madison, Miss., firm, Case Manager 1.0 lets users convert physical file data from all uppercase to mixed uppercase and lowercase letters.

The product can convert portions of records or entire records and can be run interactively or in batch mode. System/36 environment files can also be converted.

Case Manager 1.0 costs $99.

▶ *WorksRight Software*
(601) 856-8337

Computer Science Services Group LLC has introduced 49er, automated data analysis software.

According to the Wichita, Kan., company, 49er automatically formulates and evaluates queries and interprets the results.

The product analyzes data from many different perspectives, looking for hidden dependencies or regularities.

Prices start at $5,000.

▶ *Computer Science Services*
(316) 652-7700

Gilcor Enterprises, Inc. and **Southwestern Bell Telephone Co.** have announced CAMS, MVS mainframe monitoring software.

According to Gilcor Enterprises in Oakbrook Terrace, Ill., CAMS automates the monitoring of batch applications running on MVS mainframes and provides a comprehensive view of nightly batch applications to users of Computer Associates, Inc.'s CA-7.

CAMS highlights abnormalities and can manage the operation of mainframe jobs by business functions. The data is distributed to PC database servers for access from distributed workstations.

Prices range from $50,000 to $800,000 depending on the size of the environment.

▶ *Gilcor Enterprises*
(708) 575-2000

StorageTek Distributed Systems Division, Inc. has announced the 9704 Tape Library System, an automated library for 4mm digital audiotape cartridges.

According to the Liste, Ill., company, the 9704 Tape Library System provides unattended and centralized backup, recovery and archival functions for Unix and PC networks when combined with tape management software.

The product combines Hewlett-Packard Co. DDS-2 tape drives with a removable carousel that holds 25 DDS-2 cartridges for 100G bytes of uncompressed storage or 200G bytes of compressed storage.

The dual-drive design lets multiple clients back up at the same time, and a standard SCSI-2 interface is compatible with most tape management software.

Prices start at $12,000.

▶ *StorageTek DSD*
(708) 434-1200

California Software Products, Inc. has announced Baby/4xx 2.0, IBM AS/400 cooperative processing client/server software.

According to the Santa Ana, Calif., company, Baby/4xx 2.0 lets midrange users move their largest applications to PCs and PC networks using Microsoft Corp.'s Windows NT or IBM's OS/2 Warp.

The product replicates the AS/400 running on PCs and provides simultaneous processing of PC applications. Features include increased program size, larger indexes, more subfile record support and an extended print line to 255 positions.

Baby/4xx 2.0 costs $3,500 for a development system and $750 for a runtime version.

▶ *California Software Products*
(714) 973-0440

Platinum Technology, Inc. has announced Platinum Quest, query, access and reporting software.

According to the Oakbrook Terrace, Ill., company, Platinum Quest provides a graphical user interface front end to access both mainframe and client/server databases.

Users do not need to know SQL to access information. The product also accesses data and applications directly from Platinum's Integrator software, which provides PC access to legacy information.

Platinum Quest costs $695.

▶ *Platinum Technology*
(708) 620-5116

Executive Software, Inc. has announced I/O Express 2.3, automatic data caching software.

According to the Glendale, Calif., firm, I/O Express 2.3 runs in mixed Digital Equipment Corp. VMS clusters containing both VAX and Alpha AXP systems.

The product includes an AXP write-only driver that lets caching continue on clustered VAXs while letting Alpha AXP nodes write to any disk in the cluster. Features include enhanced caching of Phase II shadow sets and on-line documentation in Bookreader format.

Prices range from $480 to $19,800, depending on CPU model.

▶ *Executive Software*
(818) 547-2050

Warehousing wares released in quantity

By Rosemary Cafasso

Data warehousing products and services are rushing onto the market like water blasting from a faucet turned full tilt.

At the recent Data Warehousing Conference in Orlando, Fla., users were presented with even more new options for tools to build, implement or manage a warehouse.

Howard Dresner, an analyst at Gartner Group, Inc. in Stamford, Conn., said many of the products introduced at the warehousing conference looked pretty slick, so the essential step for users is to take a hard look "under the covers."

"What was horrible is it all looked the same," Dresner said of the products on the show floor. "It is almost impossible to discern what to buy. You really need to dig down underneath."

This recent collection of warehouse products comes from industry heavyweights and upstarts and includes the following:

Full warehouse packages

Hewlett-Packard Co. in Palo Alto, Calif., previewed a scaled-down version of its Intelligent Warehouse Solution for small to medium-size companies. It sports a starting price of $75,000, down from what had been a typical deal of about $400,000. The package includes some warehouse management tools and consulting services.

HP is also adding tools to Intelligent Warehouse to include what is essentially a card catalog that users can browse to figure out what data's in the warehouse. Another package, which HP is reselling, is report generation software from Software Interfaces, Inc. in Houston; it would allow users to generate more traditional reports from the warehouse environment.

> "It is almost impossible to discern what to buy. You really need to dig down underneath."
> *— Howard Dresner, analyst, Gartner Group*



HP said the new products will be available in April.

Meanwhile, Price Waterhouse Management Consulting Services in New York officially launched its warehousing strategy with the rollout of Knowledge Management, a consulting package that includes a warehousing methodology. Also, Price Waterhouse announced separate alliances with two companies. The firm will team with Sun Microsystems, Inc. in Mountain View, Calif., and Informix Software, Inc. in Menlo Park, Calif., to offer warehousing services.

Software AG of North America, Inc. in Reston, Va., said it will resell a high-end data access and analysis tool from MicroStrategy, Inc. in Vienna, Va. The tool will be part of Software AG's Open Data Warehouse Initiative, the company's soup-to-nuts warehouse offering. Decision Support Systems Agent includes an on-line analytical processing engine and access tools that provide data filtering and drill-down capabilities.

More on multidimensional

Kenan Technologies, a division of Kenan Systems Corp. in Cambridge, Mass., rolled out Acumate ES Version 1.2, which includes an upgraded multidimensional database and reporting tools. Kenan said Acumate will now handle much larger databases — with literally trillions of logical data cells in a multidimensional data set.



The Acutrieve reporting application will include a customization feature that would allow users to build their own multidimensional database views. The updates are scheduled for release in late February.

Warehouse tool sets roll out...

Informica Corp. in Menlo Park, Calif., introduced OpenBridge, a data extraction and transformation tool that pulls data from legacy systems and loads it into warehouses.

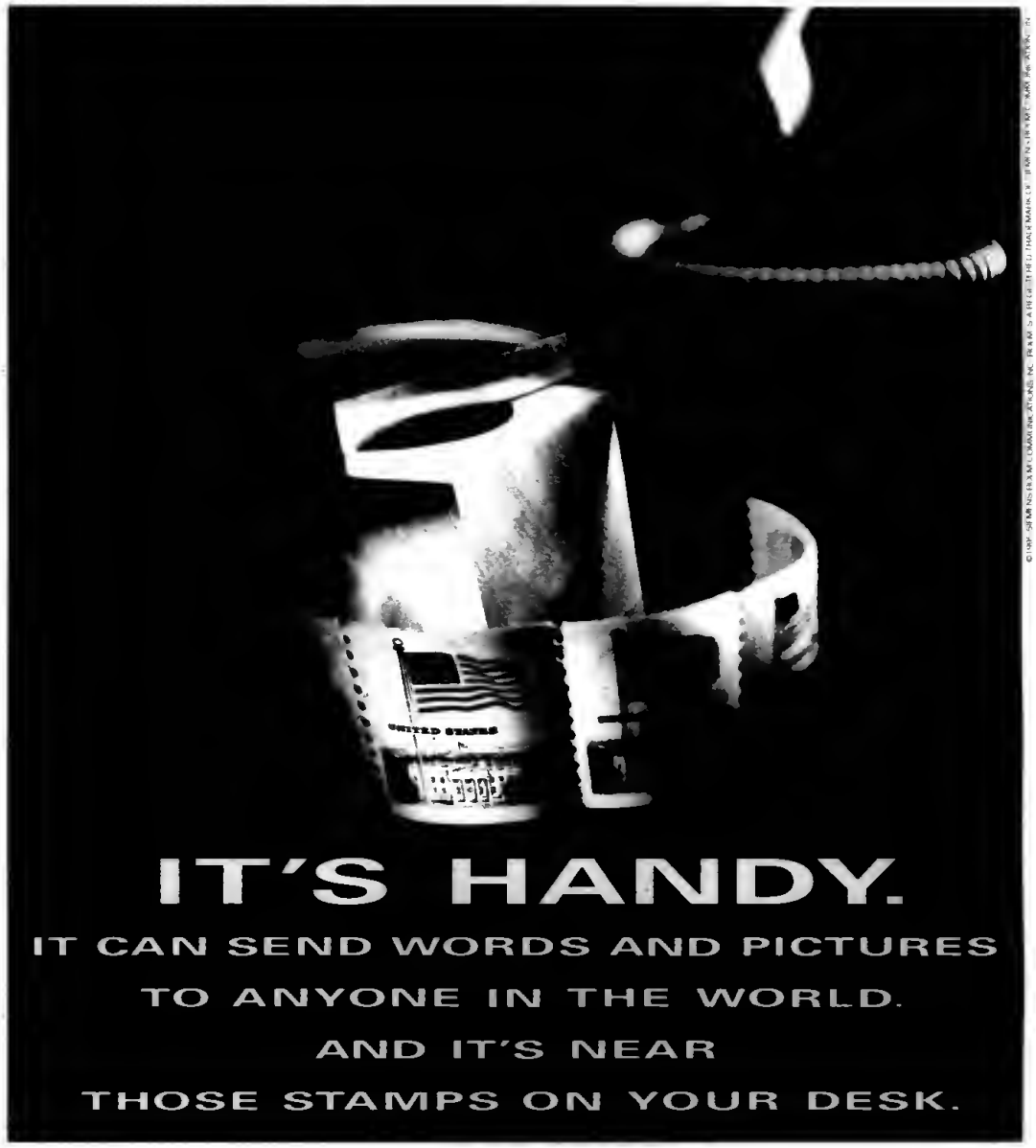
Innovative Systems, Inc. (ISI) in Pittsburgh teamed with Prism Solutions in Sunnyvale, Calif., to offer the Innovative Warehouse, which is based on Prism's warehouse management software and ISI's customer information management software. Warehouse management includes such functions as data extraction and cleansing. ISI software provides tools to standardize, consolidate and fix customer-related data.



...as do data access products

Stanford Technology Group, Inc. in San Francisco launched a set of decision-support query tools designed for big databases. MetaCube will include query management facilities to track user requests and to compile presummarized data for frequently requested information. The company said MetaCube will use the increasingly popular technique of warning users that they are about to launch a huge query.

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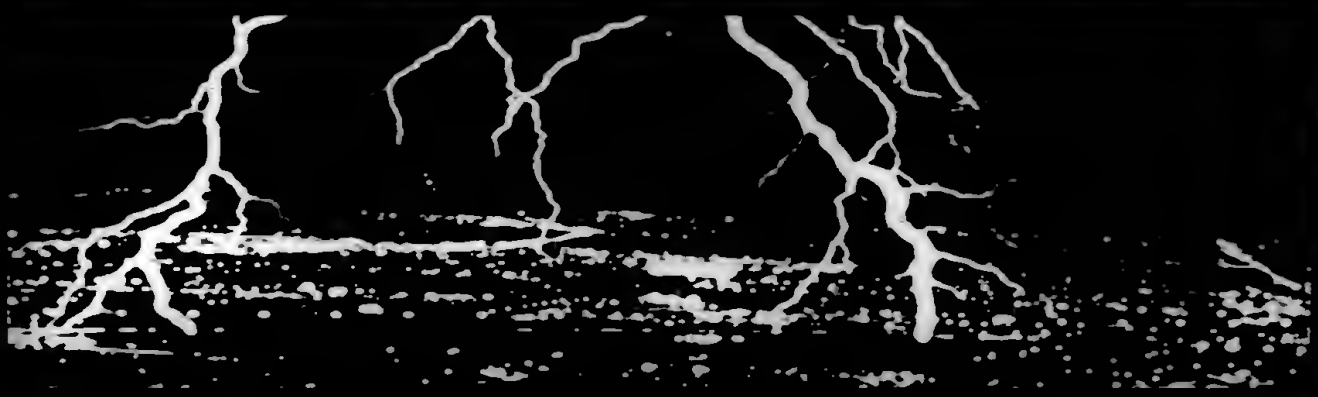
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Windows 95 development tools come slowly

By Elizabeth Heichler

To date, only a few tools have appeared to help developers create applications for Microsoft Corp.'s Windows 95.

The operating system is expected to ship this year, but tools that take advantage of its new capabilities such as native multitasking are in woefully short supply, according to Chet Geschickter, vice president of Hurwitz Consulting Group, Inc. in Watertown, Mass.

Just three C++ tools were launched at the recent Software Development '95 show for developers working with third-generation languages who want to use Version 3.0 of the 32-bit Microsoft Foundation Class library (MFC). Applications created with this set of C++ classes will automatically be native Windows 95 programs, said Enzo Schiano, MFC product manager at Microsoft.

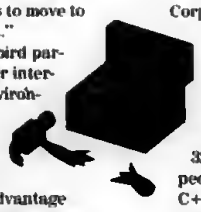
Applications for Windows 95 must:

- Be 32-bit
- Support OLE components
- Run on both Windows 95 and Windows NT
- Support large and small icons
- Provide automated installation
- Have uninstall capability
- Respond respectably to plug-and-play events

However, some developers are anxious for Microsoft to roll out a more complete version of MFC for building 32-bit applications, and they say third-party tools are not yet up to par.

"We need Microsoft to develop the rest of the classes," said Thomas Gallie, director of systems development at Image Memory Systems, Inc., an imaging software vendor in Los Gatos, Calif. "Microsoft wants us to move to Win32, but we need a complete suite of tools."

In particular, Gallie said he would like third parties to provide good user interface tools for 32-bit environments. He said vendors are selling 32-bit versions of 16-bit tools that are "marginal ports [and] don't take advantage of 32-bit functionality. We have engineered for 32 bits, and we have screaming applications, but the interfaces look crude."



The slow route

Some corporate developers are taking a slower approach. "We haven't started on 32-bit, though we'll probably go to 32-bit C++ in a while. It will depend on how fast we as a corporation go to Windows 95," said Dennis Taylor, manager of manufacturing systems at Rockwell International Corp.'s Collins Avionics & Communications division in Cedar Rapids, Iowa.

Jonathan Jones, technical lead at Martin Marietta Corp. in Littleton, Colo., echoed that sentiment. "We're thinking ahead to Windows 95 and trying to write our applications so they go across," he said.

In recent weeks, Microsoft and Symantec Corp. have updated their C++ development tools with increased support for the 32-bit version of MFC. Microsoft said it expects corporate developers who have adopted C++ will use MFC for creating Windows 95 applications, Schiano said.

Release 7.0 of Symantec's C++ tools ships with MFC 3.0 and includes a ClassExpress feature that allows developers to customize the behavior of MFC applications, according to the Cupertino, Calif., company. The resource editor, called Resource Studio, can be used to edit icons, bit maps, dialogs, accelerator tables, menus, version information and fonts.

Resource Studio also supports all new Win32 and Windows 95, *page 86*

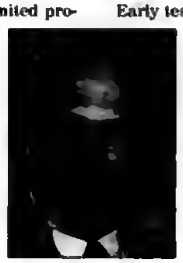
State agency steps out of the '70s with client/server

By Rosemary Cafasso

The Ohio Bureau of Workers' Compensation (BWC) in Columbus is in the final stages of a client/server development project that it says will make claims processing much more bearable.

Kim Griffin, a 13-year veteran at the agency, can attest to that. She said she once did plenty of manual work as a claims processor because the aging mainframe system offered limited processing.

"I wondered why [information systems] never asked: 'What do you need?'" said Griffin, who is now a claims technical specialist.



CIO Craig Miller: *'You have to focus on the vendor and their growth'*

Moving on up

The bureau, which plans to wrap up the project later this year, is moving from an out-of-date NCR Corp. mainframe platform — which runs applications built in the 1970s — to a platform that includes IBM's DB/2 and Oracle Corp.'s relational database management system as back-end data servers. But the key piece for claims processors is the front end — a graphical claims management application written with Microsoft Corp.'s Visual Basic.

In 1992, the host system was failing fast — it was down 50% of the time. That is when the bureau hired Craig Miller as its chief information officer.

"I came in, and we had a crisis on our hands," Miller said. "Some of the stuff was 20 years old. They weren't making new investments. My sense is they didn't understand what technology could do for them."

But Miller said he figured the agency could only improve from where it was. So he opted to start from scratch and develop a client/server-based claims processing system that would finally put the old mainframe system to rest.

Early tests show the new claims system is up 99.7% of the time, and response time is less than two seconds, Miller said.

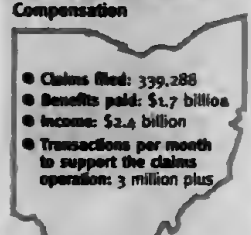
The front-end software handles data retrieval from the relational data servers and allows users to enter new claims and update claims in a graphical environment. One feature makes a to-do list for staffers that is automatically created for each workday based on the flow of claims through the system.

Wayne Kernochan, an analyst at Aberdeen Group in Boston, said companies that have used Visual Basic for mission-critical software have been successful as long as the applications are fairly straightforward. "It is when an application gets really complex [that] the need for performance really scales up and the administration needs get greater," Kernochan said. "That's where Visual Basic runs into problems."

Miller said that while Visual Basic may not be considered the top development tool for large-scale, mission-critical applications today, it was the best choice three years ago.

"You pick certain products, and the market changes," Miller said. "As soon as you make a decision, there's something better out there. So you have to focus on the vendor and their growth."

1994 statistics for the Ohio Bureau of Workers' Compensation



- **Claims filed:** 339,288
- **Benefits paid:** $1.7 billion
- **Income:** $2.4 billion
- **Transactions per month to support the claims operation:** 3 million plus

Multiple phases

But the Visual Basic piece was just one component of the bureau's project. The effort began in 1992 with a re-engineering phase that entailed examining the processes and weeding out the redundancies. At the launch of this phase, the agency had a 16-page document that mapped out all steps in the claims processing department.

"We got it down to two pages," Miller said.

The next phase called for defining requirements, building a client/server architecture and determining if any off-the-shelf software packages would work. These efforts began in late 1992 and wrapped up in October 1993.

The agency searched for, but could not find, a packaged application to suit its needs. "We didn't find anything out there that had proved it could handle our volume and would handle imaging," Miller said. "Workers' comp is very unique, state by state."

Miller said the agency pulled in help from a variety of outside sources, including Microsoft and Andersen Consulting in Chicago, which assisted with the software design; IBM, which helped design the new data center; and Sun Microsystems, Inc. and AT&T Corp., which teamed up to work with the bureau on its new network architecture.

To 3,000 users

The strategy has been to roll out the desktop software to smaller, more manageable groups of users and then upgrade the software in phases. For instance, the bureau will add imaging functions within a year. Approximately 1,600 end users are working on the system, and it will eventually be ramped up to 3,000 users.

"Before, it was compared to 1950s stuff," said Tom Davison, manager of the medical claims department of the old host-based environment. "What this [new] system did was bring us into the real world."

Doug Anderson

OLAP debate

With the growing interest in on-line analytical processing (OLAP) applications has come the inevitable debate surrounding an open relational database management system vs. a proprietary multidimensional database to manage the data warehouse for OLAP applications.

In the Dec. 12, 1994, issue of *Computerworld*, Richard Finkelstein put forth the view that relational databases cannot satisfactorily support OLAP applications. However, because most relational databases are open while multidimensional DBMSs are not, this debate in many respects boils down to evaluating the pros and cons associated with open vs. proprietary databases. Given that most of these applications are built for open client/server environments, I find it ironic that someone would propose a proprietary database for OLAP.

Open databases are better

Clearly, we have spent the past several years deciding that open is generally better than proprietary. This is particularly true for the OLAP market, which is characterized by vendors offering components of a total solution. For example, Red Brick Systems in Los Gatos, Calif., produces a RDBMS specifically for OLAP applications. Prism Solutions, Inc. in Sunnyvale, Calif., and Evolutionary Technologies, Inc. in Austin, Texas, produce data extraction tools that scan a production database and convert it into a format that is acceptable for data warehouse formats. Information Advantage, Inc. in Minnetonka, Minn., offers multidimensional OLAP products to access RDBMS data warehouses.

Because all of these products work on open DBMSs, you can mix and match the components that best suit individual requirements. These are basic concepts that have led to the rapid proliferation of open RDBMSs for a wide variety of applications while proprietary databases were becoming virtual dinosaurs.

A more interesting question has to do with whether a relational database structure lends itself to OLAP applications. The multidimensional DBMS camp uses a dimensional structure that some pundits argue can't be implemented using relational data structures. The fact is, it can be implemented by using a method called a "join-star schema" that has been around for many years.

In fact, the join-star schema has several advantages over a proprietary multidimensional DBMS. For example, because OLAP data is denormalized before being loaded into the data warehouse, most OLAP applications involve large amounts of "zero" data. If the applications use a multidimensional DBMS, these zeros must usually be stored to preserve the "cube" data structure. This dramatically increases the size of the database, sometimes by many orders of magnitude. In contrast, the join-star schema is a sparse matrix, which means that the zeros are not stored. As a result, RDBMS data warehouses are usually capable of handling much larger OLAP applications than the corresponding multidimensional DBMS applications.

Regarding performance issues, Finkelstein correctly points out that the network can limit the performance of the application if raw data is pulled over the network to an OLAP engine running on a client workstation. However, this can be dealt with in two ways: The customer can put the OLAP engine on a separate server between the database and the PC client, which limits the span the raw data must traverse. Or better yet, the customer can run the RDBMS and OLAP engine on the same server, thereby avoiding the need to transfer raw data across the network at all. Either way, the issue boils down to customer implementation rather than precluding the use of RDBMS for OLAP.

Benefits to consider

RDBMSs offer other advantages over multidimensional DBMSs. For example, RDBMS vendors have developed the performance tuning and management utilities required to manage large databases. And relational databases can be incrementally loaded, in contrast to most multidimensional DBMSs, which must be reloaded with each update or change in structure to preserve the "cube" shape. Relational databases also offer an unlimited number of dimensions; most multidimensional DBMSs limit flexibility by imposing on the database a maximum number of dimensions.

In many ways, this debate reminds me of the arguments back in the 1970s concerning the viability of RDBMSs relative to hierarchical databases. Given the current popularity of proprietary packages such as IBM's IMS-DB vs. open relational databases such as IBM's DB2 or Oracle's database, I have a pretty clear idea of what to expect.

Anderson is an independent consultant specializing in decision support and OLAP applications. He can be reached via the Internet at ander355@gold.tc.umn.edu.

Briefs

Link to CASE tools

Informix Software, Inc. last week said it plans to integrate its OnLine relational database with computer-aided software engineering tools from **Texas Instruments, Inc.** A beta test version is slated for next quarter.

Merger planned

Database management system vendor VMark Software, Inc. in Westboro, Mass., and client/server development tool maker **Easel Corp.** in Burlington, Mass., have signed a definitive agreement to merge.

Database hookup

Oracle Corp. said it plans to build Open Database Connectivity drivers to databases from Sybase, Inc., Informix Software, Inc. and others with technology from **Visgenic Software, Inc.**

Image retrieval

IBM plans to integrate image retrieval software developed by **Excalibur Technologies Corp.** in San Diego into its DB2 for OS/2 and AIX databases.


Speedware Corporation is an international organization with 25 offices around the world, thousands of satisfied customers, and products with a proven track record.

[redacted]

Raima Corp. has announced Raima Object Manager (ROM) 3.0, a C++ class library.

According to the Issaquah, Wash., company, ROM 3.0 encapsulates object storage and database navigation into C++ class definitions to provide an object-oriented interface to Raima's Database Manager and Velocis products.

The product enables C++ programmers to develop database applications that take advantage of transaction processing, Microsoft Corp.'s Open Database Connectivity, server extensions and heterogeneous clients.

New member functions provided in the TransAction class and Storagable Object class allow the use of different keys.

ROM 3.0 costs $495.

▶ *Raima*
(206) 557-0200

IXI Corp. has announced IXI Premier Motif Developer's Pack for Hewlett-Packard Co. systems.

According to the Santa Cruz, Calif., company, IXI Premier Motif Developer's Pack provides identical Open Software Foundation Motif code across platforms. IXI's Wintif libraries come bundled with the product along with standard Motif libraries so developers can automatically switch to a Windows appearance and behavior for Motif applications.

Prices start at $695 per user.

▶ *IXI*
(408) 427-7700

Black & White Software has announced Integration Manager, software that integrates multiple widgets and add-on tools into Visual Edge Software Ltd.'s UIM/X graphical user interface builder.

According to the Campbell, Calif., company, Integration Manager automatically installs and augments UIM/X with any compatible set of packages selected by the user.

Menu settings for each integration combination can be saved for future use.

Integration Manager costs $250 per user or $1,000 per platform at a network site.

▶ *Black & White Software*
(408) 369-7400

Graphing products enhance displays

X Window widgets allow two- and three-dimensional viewing

By Tim Ouellette

When mapping the ocean depths, scientists at Woods Hole Oceanographic Institute depend on custom software to be their eyes.

The nonprofit research center on Massachusetts' Cape Cod helped discover the sunken ships *Titanic* and *Bismark*. The institute obtains data records of the sea floor from a sonar device steered by acoustical navigation. However, the sonar also picks up other points, called outlyers, that are not really part of the sea's bottom. This makes the picture fuzzy.

To get a truer picture of the bottom, research engineer Jonathan Howland developed a custom application that presents the data visually, which lets scientists remove the noise-generated points. Howland programmed the application with the help of Toronto-based KL Group, Inc.'s XRT/graph graphing widget for X Window System developers.



KL Group's XRT products *use graphical displays to help users comprehend data*

Clearer picture

The XRT graphing widgets run on most Unix systems. XRT/graph 2.4 provides two-dimensional viewing. XRT/3D 2.1, which was recently released, provides three-dimensional viewing and adds Computer Graphics Metafile and PostScript output.

Reviewing sonar data at the research institute is now a one-person job. "The fact that I have a graphical way to do the job is big," Howland said. So is the fact that as an extension to the Open Software Foundation's native Motif tool kit, XRT/graph does not require that programmers learn a new interface.

"Ease of use was how we based our decision" on XRT/3D, said Raj Verma, a financial engineer at Algorithmics, Inc. Verma used XRT/3D to add three-dimensional portfolio and risk-tracking views to the Toronto firm's financial application.

"A lot of information is very complex and highly dimensional," Verma said. "XRT lets us see the information and comprehend it, so you get a sense of how much your risk exposure is."

While conforming to the X standard is a strong suit to these engineers, Verma said he hopes KL Group branches out. He said he would like the graphing widget to be available for PCs because Algorithmics plans to port its application to Windows.

According to Greg Kiessling, president of KL Group, XRT/graph for Windows will be released in the spring in 16- and 32-bit versions. Prices will range from $349 to $499.

"We are hoping the Windows side is as successful as the X Windows," he said. Kiessling said he expects XRT/graph to be positioned at the high end of the Windows market mainly because its customers have always been Unix, corporate developers who expect high quality and high support.

XRT/graph costs $1,995, and XRT/3D costs $2,495 for single developers.

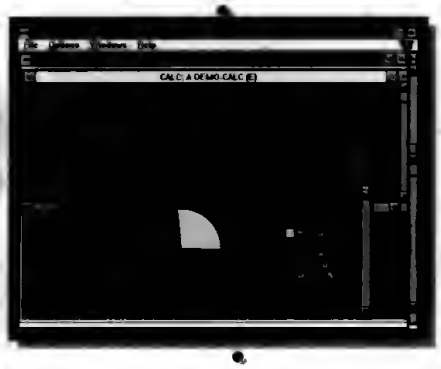


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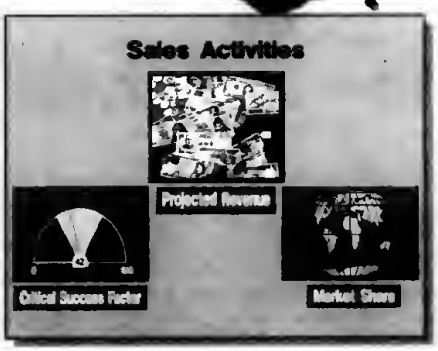








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Windows 95

CONTINUED FROM PAGE 81

Windows 95 extensions, and it is integrated with ClassExpress so that resources can be immediately connected to application code.

In the new release of Visual C++ 2.1, Microsoft added several new classes to 32-bit MFC. Included are Windows Common Control classes, support for the Simple Messaging Application Programming Interface in document classes, Windows sockets classes for network programming and new 32-bit Open Database Connectivity drivers for use with the MFC database classes.

The Redmond, Wash., company has also included an MFC migration kit in Visual C++ 2.1. The kit consists of a help file, a migration tool that scans 16-bit and 32-bit C-language source code and suggests things developers should do to migrate the code to MFC, and sample applications before migration in C and after migration in C++.

Existing 32-bit applications for Windows NT and 16-bit applications for Windows 3.1 can be converted to native 32-bit Windows 95 applications using MFC 3.0 and Visual C++ 2.1, Schiano said. The procedure in both cases would be to open the applications in Visual C++ and perform a rebuild operation, he added.

The other leading supplier of C++ tools for Windows, Borland International, Inc. in Scotts Valley, Calif., does not have any facilities for developers to use MFC in its products. This is because MFC uses Microsoft extensions to C++ that Borland does not support, according to Jerry Shockley, languages product manager at Borland. He said the company is looking into a way to provide this.

Tools release

Some smaller vendors are beginning to roll out tools for Windows 95. At the recent Software Development '95 conference in San Francisco, Blue Sky Software Corp. in La Jolla, Calif., released WinMaker Pro 6.0, a prototyper and C/C++ code generator for Windows 3.1, Windows 95 and Windows NT. The tool generates 16-bit or 32-bit applications, depending on which compiler is used, and it also generates MFC C++, spokeswoman Marylin Guarino said.

At the same conference, Jetstream Software, Inc. in Kirkland, Wash., also released a tool that generates MFC C++ source code. InstallWizard for MFC creates install and uninstall programs. A Windows 95 version is slated for shipment in May, according to the company.

Rapid application development tools for client/server do not yet support Windows 95, either. Enterprise Builder from Symantec will generate applications for Windows 95 in the next major release, 3.0, said Patrick Taylor, senior product manager in the client/server technology group based in Shelton, Conn.

Borland has also said that its new client/server development tool, Delphi, will be available for building 32-bit applications when Windows 95 is released.

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Briefs

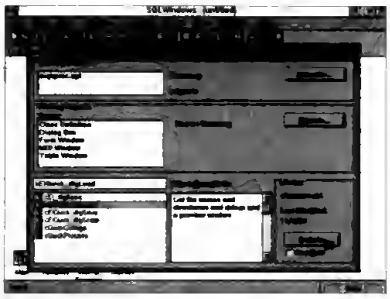
Database hookup

Oracle Corp. said it plans to build Open Database Connectivity drivers to databases from Sybase, Inc., Informix Software, Inc. and others with technology from Visigenic Software, Inc.

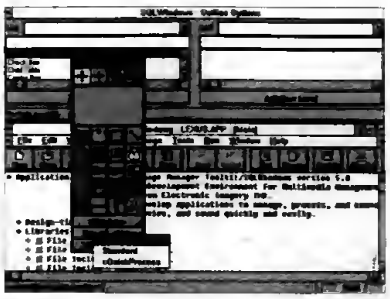
IBM gets image retrieval

IBM plans to integrate image retrieval software developed by **Excalibur Technologies Corp.** in San Diego into its DB2 for OS/2 and AIX databases.





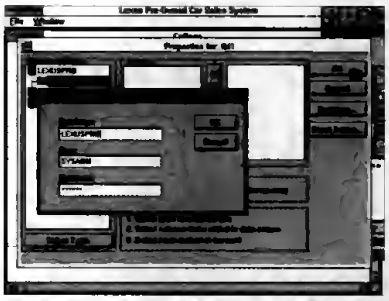
1 To build this application you'll start by importing the MediaManager QuickObject library available from Electronic Imagery, a Gupta partner. Click on the SQLWindows VIEW menu and choose the LIBRARY BROWSER. Click on EIOKPROC.APL, press the INCLUDE button. Now all of Electronic Imagery's QuickObjects are available from the SQLWindows Tool Palette.



2 Since this is an image-intensive application, you'll need a place to present digital images in your form. From the Tool Palette click on the FORM button and select EI's QUICKCOLLAGE QuickObject to create your form.



3 To make the necessary database connections for presenting textual information and the associated images, click on the TABLE WINDOW in the Tool Palette. That gives you the option of selecting a QUICKTABLE, which will make the database connections. Just drag and drop the QUICKTABLE on your form.



4 The QUICKTABLE QuickObject defines a data source and allows you to choose your database, database name and password. Now all your data connections are fully functional. Use the SQLWindows Customizer to hide the resulting table. Then use QUICKFIELD, QUICK CHECKBOX and COMMANDERS QuickObjects to lay out fields, checkboxes and buttons. Notice: you still haven't written any code.

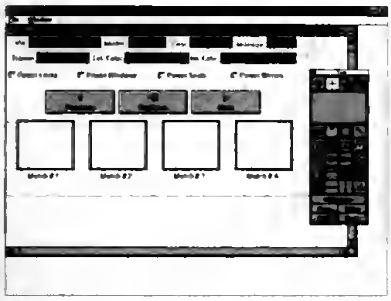


Automotive leasing generates a steady stream of pre-owned vehicles as leases expire. To speed the remarketing of pre-owned cars to 175 Lexus dealers in the US, Lexus turned to Gupta partner, Electronic Imagery, of Pompano Beach, Florida, for a graphic solution. Thanks to Gupta's SQLWindows 5.0 and EI's MediaManager™ QuickObjects library, Lexus has an easy-to-use application that manages an image database of pre-owned Lexus automobiles that can be browsed by dealers nationwide.

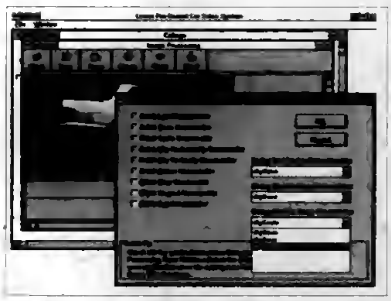
Get a quick start and a powerful finish!

The screens at left showcase the quick and powerful SQLWindows and MediaManager features that made it easy to build real-time image processing capabilities into the Lexus application. Gupta's open connectivity then allows the application to link digital images to SQL information and pass all this information to a Gupta SQLBase® image server connected to a DB2® host system at Lexus corporate headquarters.

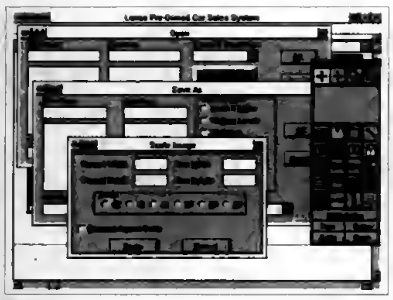
Lexus keeps its lease business rolling with a Gupta partner's QuickObjects and SQLWindows 5.



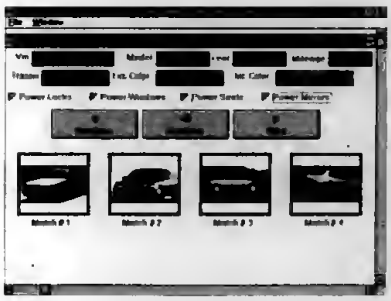
5 Now this application is taking shape. Next you'll want to create an image processing window to enlarge, view and enhance the thumbnail images in the main application. To do this, just click on the FORM button in the Tool Palette and choose EI's QUICKPROCESS QuickObject. The QUICKCOLLAGE images will be automatically linked.



6 Use the QUICKPROCESS CUSTOMIZER to select the image processing functionality you wish to evaluate in this application. List boxes let you specify pre-defined options for end-users, or you can build your own dialog-boxes to customize the application interface.



7 The Open, Save As and Scale Image dialog boxes were automatically added to your application in Step 1. These dialog boxes are automatically linked to the image processing window created in Step 6. You can click on the SHOW WINDOW button on the SQLWindows Tool Bar to bring them up and customize them if desired.



8 Now you can see how Lexus and Electronic Imagery built this application in record time. Using the easy, powerful SQLWindows point-and-click interface, just click on the RUN button in the SQLWindows Toolbar. Choose MAKE EXECUTABLE in the FILE menu and the application is ready for distribution to Lexus dealers across the USA.

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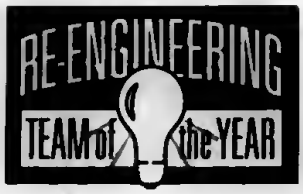
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LOAN

By Joseph Maglitta

Faced with the loss of their company charter and jobs, this plucky team created a new mortgage issuing process that's outlasted a corporate takeover, three champions, its former parent company and an industry crash. Others at Independence One Mortgage didn't fare as well.

Unlike most re-engineers, Matt Maguire says he wasn't particularly worried about having a job when the project ended.

True, business volume at Independence One Mortgage Corp. (IOMC) had fallen nearly 50% since the home refinancing boom ended in February of last year. And loan delivery had gotten so slow — up to 90 days — that the federal government threatened to revoke the Southfield, Mich., mortgage bank's charter.

But Maguire, a network engineer, was confident that technology would play a key role in turning around and driving the troubled mortgage business.

"We were like a 1988 sedan driving down the road with bald tires and missing some lug nuts," Maguire says. "As we got going faster, things started shaking more and more. I knew we were needed."

Sure enough, Maguire was right: He and the 12 other re-engineering team members at IOMC not only survived the project, but they outlasted the company and its parent company as well.

Welcome to re-engineering circa the mid-1990s, where the business climate outside the redesigning company can be just as volatile as that inside — and often more so.

While survival is one sign of success for the winners of this year's "*Computerworld* Re-engineering Team of the Year" award, their results speak for themselves.

The team's reinvention of what one member described as "an atrocious" mortgage loan origination system reduced loan turnaround from an average of 62 days to 15 or 20 days, eliminated overtime, trimmed operating costs by $1.9 million in the first year and promised three-year savings of $10 million through reduced head count and improved efficiency.

The 14-month effort was relatively inexpensive: $1.2 million, including $907,000 in consultants' fees and expenses, $55,000 for training and a mere $48,000 for new PCs and fax modems. The effort's bittersweet success vaulted it over dozens of entries submitted to *Computerworld* editors.

Ironically, three months after the revamped loan origination process began rolling out last April, IOMC sold its $10.4 billion in assets to Norwest Mortgage, Inc., a unit of Minneapolis-based Norwest Corp. and the nation's largest consumer mortgage lender.

Maguire and seven other re-engineering team members accepted jobs at Norwest. Their new offices were four floors above their former location in suburban Detroit's Galleria Officentre.

Others at IOMC didn't fare as well: Remaining members of the company's 23-person information systems department who didn't want to relocate to Des Moines, Iowa, had to find new jobs, including Robert Keuten, IS vice president.

Four of the six IS staffers who worked



Members of IOMC's re-engineering team include (left to right) Michelle Joans, Frank DeGradi, Charles Feyt, Sherri Dalka, Annette Tirabasso, Matthew Maguire, Ty Sischo, Carrie Battaglia, Jay Shell and John Queen

on the project declined offers with Norwest. They joined some 43 data entry operators, supervisors and an assistant vice president whose jobs had been eliminated by the new process several months earlier.

All told, some 70 IOMC workers in processing, sales and telemarketing were displaced, retired or laid off as a result of the mortgage re-engineering effort. Overall, about 700 of 1,100 IOMC employees were released following the sale.

But all was not lost: Steven Earman, senior vice president and divisional sales manager for Norwest Mortgage in Dayton, Ohio, says the new owner plans to incorporate the revamped process into its own operations.

"With this acquisition, we wanted to give Norwest the ability to grow in Michigan and Indiana," Earman says. IOMC's "re-engineered operation matched how we envisioned things being done."

The latest twist occurred earlier this month: Michigan National Corp., IOMC's former parent, announced its sale to National Australia Bank Ltd. If approved this spring, the $1.56 billion deal will be among the largest ever U.S. bank takeovers by a foreign institution. A 191-branch regional bank, Michigan National expects its own re-engineering initiative, Project Streamline, to yield $85 million in savings this year.

How an inexperienced, overworked band of neophytes transformed a key process from industry laggard to respectability is a classic case of desperation sparking innovation.

The story begins in 1991, when the lowest interest rates in three decades sent nearly two-thirds of U.S. home owners scrambling to refinance their mortgages. Millions of people also bought homes. At peak, annual mortgage sales hit $1 trillion.

IOMC and other mortgage firms struggled to keep pace. Between 1991 and 1992, the annual value of new loans written by IOMC skyrocketed, from $2 billion to $5 billion. The explosion continued into 1993.

"When the refinance boom hit, we were doing a good job," former Chief Executive Officer Eric D. Booth says. "But what worked at x number of loans didn't work at 10x. We were fighting to stay alive." On average, 100 applications with 1,000 pieces of related mail poured into the Michigan Processing Center each day. Many of the 110-member processing staff worked 50 or 60 hours, six or seven days a week.

"I can remember taking mail home and sorting two hours at night," says Ty M. Sischo, a loan processor. "We were hiding it."

Despite the extra effort, customers still complained about long waits and missed deadlines. Worse, Booth says, Michigan National Bank branches, which fed IOMC, began to funnel their mortgage business elsewhere.

No wonder: The unit ranked at industry bottom in virtually every key performance measure.

Each employee closed only four loans a month — far fewer than the bank's best competitors. High error rates made it difficult to sell loan pools on the secondary market. As a result, the firm lost $12 million in pool interest in 1993. Costs were sky-high, fueling three years of huge operating losses. Things got so bad that the U.S. Office of Comptroller of Currency threatened to revoke the bank's charter.

Michigan National's board of directors sent a sharp message to IOMC: Shape up fast.

So in July 1993, the board instructed IOMC's chief operating officer, Brad Guston, and Booth, then chief financial officer at Michigan National, to call in Deloitte & Touche to help devise a new business strategy. IOMC already used the Wilton, Conn., Big Six firm for accounting, so it seemed a natural choice for consulting, Booth explains.

Deloitte & Touche dispatched Charles L. Feyt, an Atlanta-based principal and national director for the financial services lending group. A 16-year industry veteran with strong business and technology experience, Feyt called in principal Jack Bowerman and senior manager Mitch Welch from Deloitte & Touche's Kansas City office. The team quickly identified three key goals: boost productivity and quality and lower costs via better processes and technology.

Front-line conditions were shocking. Callers often waited 15 or 20 minutes on hold. "People were lined up at fax machines, waiting to fax out foot-thick payoff requests," recalls Jay R. Shell, a telecommunications systems engineer. "We just kept buying more fax machines."

Julie Else, an underwriter and team member, says it often took up to three weeks for a file to reach a processor. "The customer was calling thinking they were close to being approved, and the processor didn't even have the loan yet," she says.

IOMC had already tried several ways to handle the avalanche of 45,000 new loans a year. First, newly hired workers were assigned a single, specific task. In theory, their discrete pieces could be quickly assembled downstream into a completed loan.

"Maybe the assembly line made sense

Loan survivors, *page 90*

RE-ENGINEERING TEAM of the YEAR

Loan survivors

CONTINUED FROM PAGE 89

because we're here in Detroit," jokes Frank S. DeGradi, vice president and regional sales manager. Unfortunately, the concept quickly bombed.

Various software enhancements to an existing mortgage processing system also failed to improve things.

Booth became IOMC's CEO in September 1993. Convinced that only outsiders could bring the perspective and discipline needed to turn IOMC around, he retained Deloitte & Touche to help make re-engineering part of the company culture.

Booth also didn't want senior executives on the design team. "I wanted doers, not managers, as problem solvers," Booth explains. "The managers had their chance." By now, Guston had left.

Annette M. Tirabasso, a manager in Deloitte & Touche's national financial services industry practice, took over daily re-engineering operations. Two Atlanta-based consultants were assigned full time to the project: George Clark, design team leader, and Blair Schrum, who would assist with implementation.

Their task was to design and implement new processes, technology, job descriptions and organizational structure using Deloitte & Touche's "Re-engineering for Results" methodology. IOMC Executive Vice President Ken Alverson would act as project sponsor.

From July through December, consultants and top management, led by Feyt, hashed out vision and concepts.

In early January 1994, voice-mail messages went out across the corporation soliciting volunteers for the project's design teams. Twenty people stepped forward; top managers and consultants handpicked the best.

The group set out on a do-or-die mission: speed loan processing by inventing a standard origination process for IMOC's 25 branches. They had orders to completely overhaul the loan process, from application through investor delivery. Goals included zero processing errors and returning all phone calls within 24 hours.

The design team began holing up in a windowless fifth-floor training room equipped with PCs and white boards. "We had breakfast, lunch and dinner together," recalls Carrie Battaglia, regional operations manager and full-time team member.

Brainstorming began in late January. During that period, two dozen interviews and 10 "challenge sessions" took place.

Eventually, three new teams were formed: pilot team, restructuring team, and training team. Deloitte & Touche provided just-in-time instruction on re-engineering, teams, change management and other relevant topics via articles, book chapters and personal coaching.

At first, DeGradi says, having outsiders and lower-ranking employees driving such a key effort seemed awkward. But he and others also accepted the reality: "We either had to change or we would be swallowed up or eliminated," he says.

There was plenty to fix. The existing process was mostly manual; approving a loan required 10 separate files passed between nine departments, 30 different handoffs and 234 workers. One processor complained: "I spend a great deal of time reading, refaxing and highlighting work already completed." Experienced staffers got paid weekend overtime to photocopy files.

Chaos ensues

Technologically, the picture wasn't much better. During the refinancing boom, telecom engineer Shell says incoming phone calls at the center quintupled, to 6,000 a day. Even with an automated voice-response system on the phones, he says, "it was absolute mayhem."

Moreover, only a few departments used the existing system from Mortgage-Flex Systems, Inc. in Jacksonville, Fla. Because few workers knew how to link, or "chain," files between departments, each group ended up keying in the same information on their dumb terminals (see chart above).

It was just as well, Maguire says. The firm's Novell, Inc. NetWare 3.1 infrastructure couldn't keep up with fast growth anyway. As the number of terminals and IBM PS/2 Model 95s in the building hit 800, crashes, frozen screens, network errors and lost documents became a constant headache, Maguire adds.

Predictably, morale and company pride were low. "Nobody wanted to take responsibility," says processor John Queen.

Against this frenetic backdrop, design teams set to work. Every aspect, large and small, got examined: compensation, customer satisfaction, cycle times, forms used and organizational structure.

After careful study, re-engineers began to reorganize the nine departments into three cross-functional work teams. Each team would include three "cells" of four to seven members.

The idea was simple: take a serial process based on individuals and replace it with a parallel team process (see chart page 91).

Tasks formerly done by separate departments — data entry, completing closing packages and allocating loans to a mortgage pool — now fell to self-directed teams with start-to-finish responsibility.

A pilot team began testing on March 7, 1994. Unfortunately, rising interest rates abruptly turned boom into bust.

"All of a sudden, the volume dropped to half," recalls DeGradi, the business department sponsor. Adds Feyt: "There was real day-to-day pressure from senior management. They were saying, 'You need to find some savings. Now.'"

So consultants, teams and management quickly agreed on a dual track that would ensure short-term payoffs as well as long-term change. Instead of waiting until the entire pilot was complete, small improvements would be implemented as soon as they were developed.

For example, replacing 10 paper files with a single on-line form saved each loan processor three hours a day of paper-shuffling and writing.

Existing technology used

Corporate policy at Michigan National drove an early decision to shift from a mainframe to a LAN-driven approach. Although the MortgageFlex system had been around for a couple of years, users had received little training and knew only a handful of basic functions.

"The was a lot of pressure to maximize the use of current applications," says Feyt, who had conducted a technology analysis and discovered the underusage.

Teams decided an updated version of the system and beefed-up hardware and LANs could easily support the re-engineered process. About 70% of the needed software functionality already existed. So the bank's IS unit, Automation Services, focused on adding the new 30% by optimizing and modifying MortgageFlex.

Three full-time programmers, three business analysts and four part-timers went to work.

They soon created a gateway to a corporate IBM MVS system via NetWare 3.1, added network management software on each LAN, installed Memorex Corp. terminal controllers and added disk capacity and memory, among other things. Teams also installed new Compaq Computer Corp. PCs equipped with fax modems. And they brought in trainers to teach about MortgageFlex.

Where technology was fragmented in the old process, the new system supported every step. For example, truth in lending documents, automated work sheets, item tracking and borrower letters went on-line. Key batch reports were modified and made friendlier. And for the first time, new loans could be tracked on-line.

Despite the heavy planning, communication, top-level support and technical progress, resistance immediately flared.

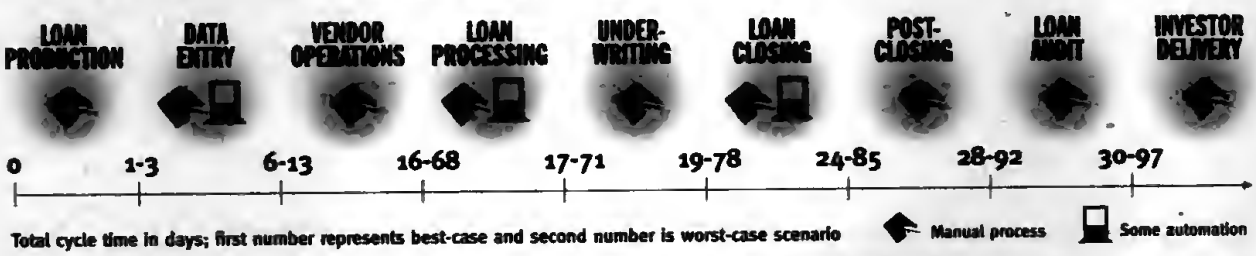
Middle managers resented losing much-needed staff, Battaglia says. "People said, 'It'll never work. It's a waste of time. You're taking our people away.'"

Workers also balked. Michelle Johns, a regional underwriting manager, sums up their attitudes: "Heard it before, tried it before, seen it before. People were worried that the team was just sitting around in a room, ordering pizza and coming up with a mission statement."

But as enhancements began coming out of the group, people started to come around.

OLD PROCESS FLOW

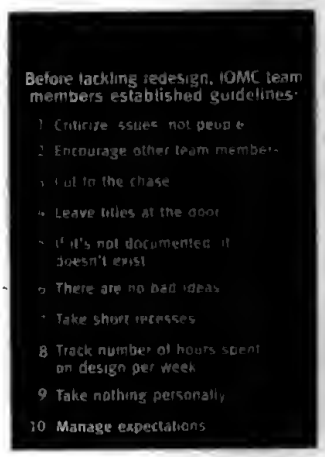
Independence One's traditional way of approving mortgages was slow, linear and involved seven paper files and handoffs between nine departments



Total cycle time in days; first number represents best-case and second number is worst-case scenario

Manual process

Some automation



Even so, Tirabasso says seemingly simple tasks such as getting consensus on automating a closing work sheet often proved surprisingly difficult. "Each office wanted something different. They'd say, 'I don't want to automate. I don't think my staff can handle it,'" she says.

"There was general frustration with IS in the field. Growth was happening so fast it was tough for them to keep up," Feyt says.

Even IS was a bit apprehensive, recalls one team member. "The systems people were on board, but they were nervous. They were afraid they'd have to go back and redo things they'd already done."

Sales-force fear

By far, the strongest opposition came from the 300-member sales force, according to DeGradi. Because the new method was a radical departure from traditional ways of producing loans, many underwriters balked.

"They were used to working with one person," DeGradi says. He began to worry. "Seeing some high-producing salespeople not buy into the concept and leave the company makes you wonder whether or not this was the right thing to do."

Fearing an underwriter exodus, the team devised a strategy: sell key sales reps on the system, then have them convince others. Regional reps were flown in from Michigan, Dallas and Chicago. DeGradi also became a traveling salesman, jetting to IOMC offices around the country to plug the new system.

How did it work? "Only 10 salespeople left," he says proudly. The approach was later used on internal processors and telemarketers.

Ironically, IOMC senior management also posed a challenge. Booth and Alverson got so excited with the innovations they wanted to rush the new process and system into production. "I was very concerned," DeGradi recalls. "At this point, [it] was still in beta. If we rushed, things could have totally backfired and made service worse."

Luckily, the consultants and re-engineering team persuaded management to finish the testing and postpone rollout for 60 more days.

Occasional doubts plagued team members. "Every day I'd come in and say, 'What am I doing here?'" says branch operation supervisor and part-time team member Sherri Dalka. "But I would have been more concerned if we were not chosen for the design team," Else adds.

When anxiety grew too great, Tirabasso set up meetings with Booth and Alverson, who tried to dispel concern over layoffs by voicing their support. Members add that seeing payoffs from initial changes also calmed fears.

A training team convened in late March. System rollout began in April 1994. The Southfield service center was to go on-line first, to be quickly followed by two dozen offices in Lansing, Grand Rapids, Troy and other communities.

By now, the effort had expanded to 80 part-time and full-time people in six teams. Work continued into June.

Early results were dramatic: Nine departments and 14 functions were eliminated. The number of work steps, formerly 153, was halved. The new process saved the average processor two to four hours of phone time a day.

Organizationally, management flattened from six levels to two. Because underwriters now handled some upfront paperwork such as appraisals, processors saved two or three hours a day. Onboard faxes promised to eliminate lines at machines. After two months of piloting, enthused team members got ready for full production.

Sold!

Then in early summer, the bombshell hit: IOMC had been sold. Rumors of a sale and layoffs had circulated for months, but few believed it would happen. "A lot of people were hoping to the bitter end that they would keep operations intact," one IS executive says.

The sale rekindled layoff fears among team members. But many, like Maguire, voiced surprising confidence. Recalls Feyt: "Their attitude was, 'The better we can make ourselves, the more efficient and effective we are, the more control we will have over our own destiny.'"

James M. Schutz, vice president at The Chicago Corp., a Chicago-based financial research firm, says there was nothing the team could do to halt the sale.

Michigan National management "was under enormous pressure from dissident shareholders to cut back on everything," Schutz says. "And Independence One was definitely a drag on Michigan National."

By now, the initial rollout was 40% complete. Several IS staffers were quietly offered bonuses to continue work on the project. The new owners extended job offers to IOMC team members. Seven staffers from Automation Services accepted. Team members Doug Smith, Sherry Ott-Rustoni and Wendy Ravanugh took posts at Michigan National.

By September, Booth had left to become president and CEO of Lomas Financial Corp., a financial giant in Dallas. Alverson went to First Fidelity of New Jersey.

Keuten, the head of Automation Services, stayed behind. He currently presides over an IOMC skeleton crew of six contracted to provide LAN telecommunications processing for Norwest until regulators approve the final sale. Although he cannot speak about the project because of an IOMC gag order, Keuten reports that the 16 others in Automation Services have found new jobs.

Team members say they're happy their work lives on. They welcome a chance to make a bigger impact.

Earman, the Norwest sales manager, says the IOMC team structure and process will be kept intact. The re-engineered IOMC process "has been very useful from a research standpoint," Earman says, adding that Norwest is developing a similar centralized processing system at its Iowa processing center.

It's unclear, however, if the IOMC system can be scaled up for Norwest's 3,000-member sales force. An observer familiar with the work suggests IOMC's approach will probably be used in new, smaller banks acquired by Norwest or be offered as a commercial service.

Meanwhile, customers seem pleased with the new approach. "When I first bought a home years ago, it took months to get a mortgage," says Joyce Babinski. An office manager at a water systems company, Babinski recently purchased a ranch house in Troy with a 9% mortgage processed by the new system. "No problems or delays," she reports.

Maguire remains confident. "We had the right strategy and the right technology. Norwest didn't just get a system; they got human resource assets with this purchase." ■

Magiitta is *Computerworld*'s senior editor, corporate strategies.

NEW PROCESS FLOW

Cross-functional teams handle key tasks simultaneously, slashing loan turnaround time by up to 83% to 15 to 20 days



Among the many tools used to get the word out were the following:

MEETINGS: Kickoff for 120 workers, monthly "Team Meetings" with entire company and management team, "challenge" sessions to test ideas.

PRESENTATIONS: Update of CEO and top executives at key points by design team members, coached by consultants.

VOICE MAIL: Weekly project update sent to all employees.

FAX NEWSLETTER: "Design Team Update" sent out regularly, including phone numbers for team members.

All affected workers received at least four hours of training. Among them were the following:

INTRODUCTORY SEMINAR (1 DAY): Process overview, basic file and computer concepts.

MORTGAGEFLEX APPLICATION (1 DAY): On-site session by software vendor.

CUSTOMER SERVICE (1 DAY): Phone etiquette, written communications, managing expectations and so on.

SPECIAL CASES (FIVE 1-HOUR SESSIONS): Credit problems, self-employed borrowers.

LEADERSHIP (2 HOURS EACH): Team roles, conflict, communicating ideas.

ONGOING TRAINING (FIVE 1-HOUR SESSIONS): Developed as needed.

"Full-time team members are key. Part-time teams don't take twice as long to do the same work — they take three to five times longer."
CARRIE BATTAGLIA, OPERATIONS MANAGER

"Don't rush in. Take time to pilot."
ANNETTE M. TIRABASSO, CONSULTANT

"If you're not willing to step outside the box, you're not going to be successful."
FRANK S. DEGRADI, VICE PRESIDENT, SALES

"Pick doers, not managers, for front-line work."
ERIC D. BOOTH, FORMER CEO

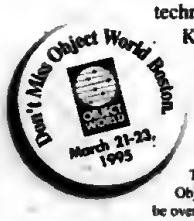
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26. Programming Supervisor
27. Software Development Manager
28. Technology Planning Manager
29. Project Manager
30. Technical Manager
31. Software Developer
32. Development Manager
33. Researcher
34. Programmer
35. Other

D. Number of Employees in Your Company?
36. Under 100
37. 100-499
38. 500-999
39. 1000-4999
40. Over 5000

E. Which Functions Do You Perform, or Expect to Object Technology?
41. Final Decision Maker
42. Specify
43. Recommend
44. Approve
45. Develop/Use
46. Resell
47. Other

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49. Smalltalk
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56. Distributed Management Facility
57. Class Libraries
58. None
59. Database
60. Internet/E-mail Addons

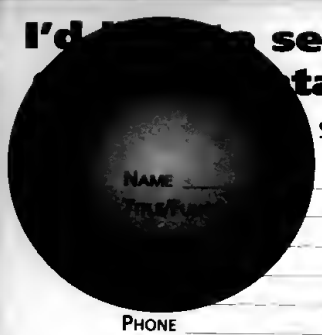
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Calendar

MARCH 12-18

15th Annual Use of Clinical Information Systems Conference. Snowbird, Utah, March 12-15 — Contact: Association for Applied Clinical Information Systems, Ann Arbor, Mich. (313) 971-6557.

Managing the Information Resource: Information Technology and the New Value Equation. Los Angeles, March 12-17 — Forum focuses on frameworks, techniques and skills necessary to align information technology with the needs of business. Contact: Marcie Desmond, Cambridge Technology Partners, Cambridge, Mass. (617) 374-6702.

13th Annual National Conference on Ada Technology. Valley Forge, Pa., March 13-16 — Contact: Rosenberg & Risinger, Culver City, Calif. (310) 397-6338.

Toward an Electronic Patient Record '95. Orlando, Fla., March 14-19 — Eleventh international symposium on the creation of electronic health record systems and global conference on patient cards. Keynote presentations include "Cutting the Hype: Real Life Demonstrations of Today's Capabilities" and "Focus on the Patient: Effects of Changing Technology on the Patient." Contact: Medical Records Institute, Newton, Mass. (617) 964-3923.

MARCH 19-25

Life Office Management Association Systems Forum and Exhibit 1995. Orlando, Fla., March 19-22 — Life insurance industry conference features more than 800 management and technical sessions in areas such as data security, client/server and LANs. Contact: Guide International, Chicago, Ill. (312) 245-1599.

National Fiduciary and Securities Operations Conference. Orlando, Fla., March 19-22 — Features 30 concurrent sessions divided into five categories: management, securities, products and services, technology and global custody. Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

Object World. Boston, March 19-23 — Contact: IDG World Expo, Framingham, Mass. (508) 870-6700.

FOSE '95: America's Integrated Information Technology Exposition. Washington, March 20-23 — Contact: Reed Exhibition Cos., Silver Spring, Md. (800) 791-3673.

PCB Design Conference. Santa Clara, Calif., March 20-24 — Focus on emerging technologies used to design and manufacture printed circuit boards. Contact: Yolanda White, Miller Freeman, Inc., San Francisco, Calif. (415) 905-2354.

The Business Side of Software and Technology Licensing. Atlanta, March 23-34. The conference will also be held April 20-21 in Chicago and June 8-9 in Washington — Fee is $1,375; member discount price is $1,195. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699.

MARCH 26-APRIL 1

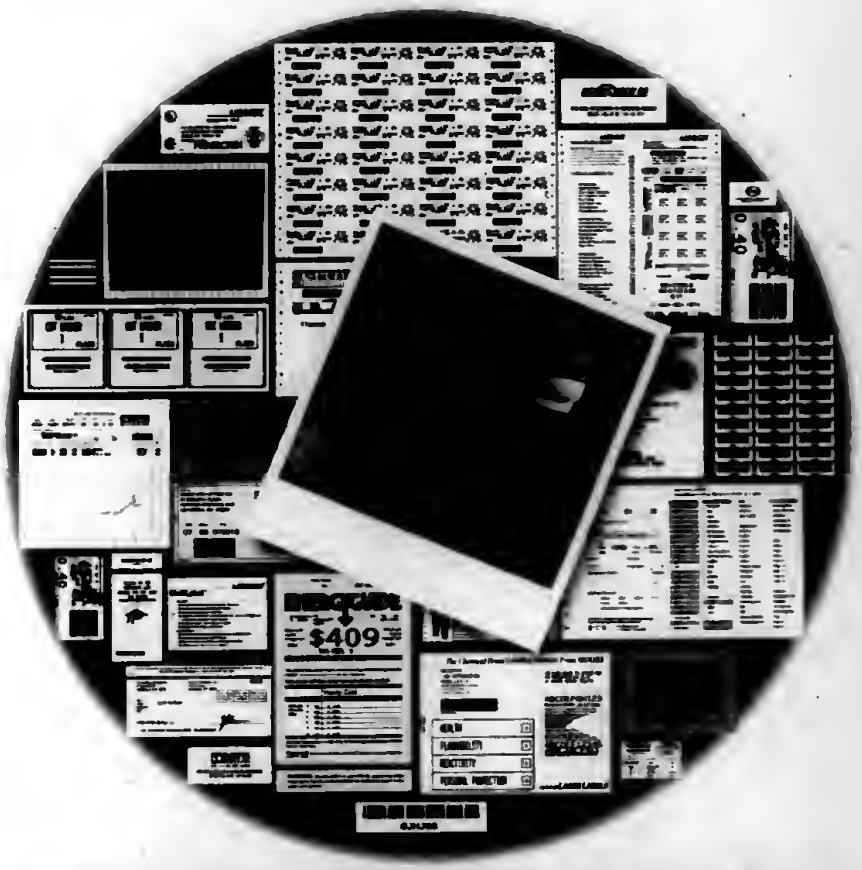
The Sixth Annual Commercial Lending Executive Conference. Irving, Texas, March 26-28 — Theme: "Banking on Change. Tomorrow's Bank. Today's Leaders." Contact: BancA/Andersen Consulting, Dallas, Texas (214) 761-8127.

National Automated Clearing House Association 1995: Electronic Payments, Business Solutions. New Orleans, March 26-29 — Conference focuses on radical changes in the way corporations, consumers, governments and financial institutions exchange information and payments. Contact: National Automated Clearing House Association, Herndon, Va. (703) 742-9190.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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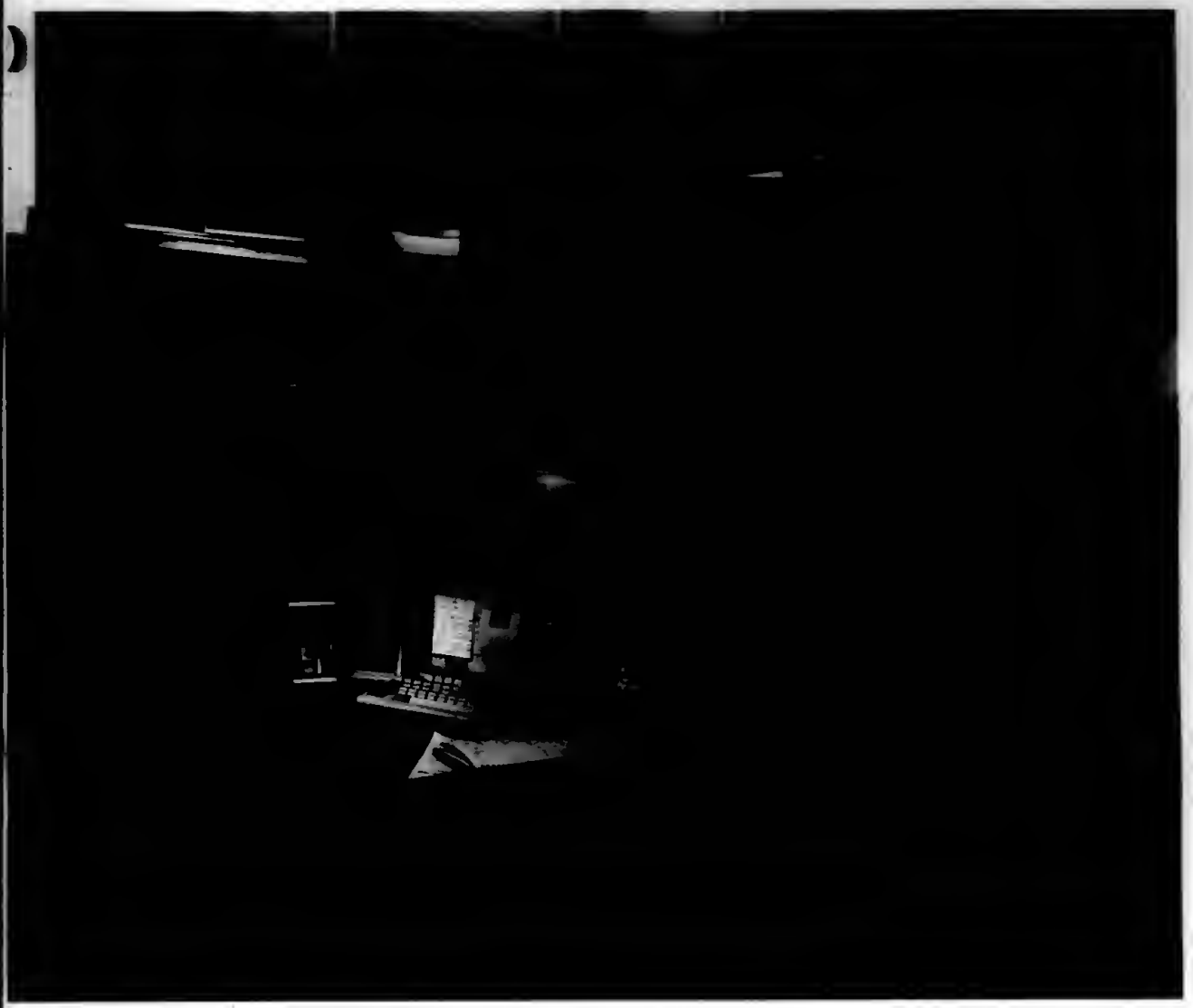
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The CW Guide to Notebooks

INSIDE

FOOL'S GOLD
Making the most of your notebook investment requires careful attention to support issues ranging from software distribution to intensive user training. **Page 98**

POWER DRAIN
Battery life is still an issue for today's notebook gunslingers, but new technologies may soon give them more ammunition than they've ever had. **Page 100**

SIFTING THE GEMS
Four high-performance notebooks from Apple, Compaq, IBM and Toshiba score well on screen readability but fail to draw high-satisfaction ratings in other categories from more than 200 Buyers' Satisfaction Scorecard users. **Page 102**

RARE DIFFERENCES
It takes a lot for a notebook to stand out and NEC's Versa M does so with a high-resolution screen. Our Firing Line evaluators find the product strong on screen quality but weak on battery life. **Page 104**





Jamie Hogan

NOTEBOOK GOLD RUSH

BY MICHAEL FITZGERALD

More powerful, feature-rich notebooks at lower prices are causing companies to put an increasing number of systems into users' hands, creating a support nightmare for IS

The frantic feature fest that marks the notebook computer market has corporate America rushing toward the new frontier of remote computing.

One in four PCs sold this year will be a notebook computer, up from one in five last year, predicts International Data Corp., a market research firm in Framingham, Mass.

Driving this increase in sales is the accelerating performance of notebooks. Not only do they offer faster chips and larger hard drives (whole families of Pentium notebooks with 1G-byte hard drives will appear this year), but also video, audio, built-in answering machines, CD-ROM drives and advanced graphics. Notebooks are even getting high-resolution screens to make Windows run more effectively.

All these changes will bring notebooks closer to desktop PC performance levels and cause companies to look at replacing PCs with notebooks.

One thing driving the uptick in notebook sales is the expected end of a near two-year constraint on color flat-panel displays and a push by Intel Corp. to get Pentium into the notebook market.

Users may even reap the benefits of the first-ever notebook price war, thanks to Intel and a gunfight for market share between major vendors and notebook upstarts such as Hewlett-Packard Co. and Digital Equipment Corp.

But becoming a notebook nation has its costs. As companies pour tens of billions of dollars into outfitting their users with mobile computers, they may find a sort of reverse alchemy at work that turns good dollars into fool's gold.

And if companies don't pay attention to the support issues that information systems managers must address as they roll out notebooks to the workforce, the costs of poorly managed notebook deployment may overcome the benefits.

THE NOTEBOOK FRONTIER

Preserving law and order

Lacking the central control of desktop PCs, notebooks pose myriad problems for IS managers charged with ensuring security, proper training and access to corporate systems. Thus far, few tools and little attention have been focused on these issues.

The move to notebooks represents a modern-day Wild West for IS managers. Like the many uncertainties a Pony Express rider faced, corporate IS managers never know what they might run into when rolling out notebook projects, and stories of failed projects abound.

At the same time, being aware of the breadth of issues created by implementing notebooks can put a company's project alongside other success stories.

One thing managers need to keep in mind, observers say, is that companies tend to deploy notebooks to their gunslingers — the salespeople and traveling executives who ride the range. These people often have never used a computer and may have no interest in using one.

Companies that implement notebooks must think about the administrative side of notebook rollouts, including the following:

- **SOFTWARE UPDATES.** Sending a large file over a network is administrative heaven compared with shipping new versions of software over phone lines.
- **REMOTE CONNECTIONS.** Software and hardware options from companies such as Shiva Corp. and Symantec Corp. work but can be maddeningly slow. This can make even basic electronic-mail sending and receiving feel like getting a tooth pulled. But a CIMI Corp. study showed that to give a single remote user 100M bit/sec. access to the corporate LAN would cost $16,000 a month.
- **TRAINING.** Notebook users tend to make their money outside of the office. A day in training is a day of missed profit targets. But untrained users often don't use the technology.
- **SECURITY.** All the issues you face on your corporate network exist in the notebook realm, with the added twist that notebooks — and the corporate data on them — can be stolen.
- **BACKUP.** A matter of fact on the corporate network, a matter of fiction in the field.

"How do you handle software updates for 6,000 people, some of whom are hundreds of miles away?" is the not-so-hypothetical question posed by Michael Radigan, project manager at Xerox Corp. in Rochester, N.Y.

Radigan says that running data over a 14.4K bit/sec. modem "is completely inadequate" for large file transfers in today's communications environment. Worse, his initial research into using next-generation modems, which run at 28.8K bit/sec., shows that even in some heavily populated regions, telephone service often causes the data rate to "step down" to as little as 2.4 K bit/sec.

Nonetheless, Xerox is moving toward a virtual office environment for its salespeople as fast as its leases allow. Many salespeople are still in the sales office on a weekly basis, which allows them to take advantage of the internal network.

Technology advancements have the potential to address some of these issues. For instance, Integrated Services Digital Network would ease the pain of phone transfers — if it ever establishes itself in the market.

Still, phone lines do work at Eastman Kodak Co.'s Office Imaging Division; the 1,000-user sales force gets quarterly software updates over the phone line.

Robert Valeri, project manager at Kodak, says a "zipped" file can take 40 minutes to send, but that's only once a quarter. At Kodak, "we have to send files over the phone," Valeri says. "We can't be mailing out diskettes or trying to do things in person."



AST ASCENTIA



DELL LATITUDE

NO TWO NOTEBOOKS ARE ALIKE: A guide to the market-leading products

High-end leaders

Leaders always have the latest and greatest technology. Right now, this means the biggest screens (10.4-in.), fastest processors (Pentium and DX4/100) and any combination of lithium ion batteries, CD-ROM drives, 16-bit audio, local bus graphics, 840M-byte hard drives and integrated AC adapters. These feature-crammed boxes weigh in the 7-pound range and cost more than $4,000. They also include the standard two PCMCIA Type II slots.

COMPANY	PRODUCT	PROCESSOR*	PRICE	FEATURES
Apple Cupertino, Calif.	PowerBook	Motorola, Inc.'s 33/66-MHz 68040	$4,079 to $4,999	GlidePoint finger mouse, built-in Ethernet.
AST Research Irvine, Calif.	Ascentia 910N	25/75-MHz DX4	$5,099	6.3 pounds, Plug and Play ready, lithium ion battery.
Compaq Houston	LTE Elite 4/75CX	25/75-MHz DX4	$5,499	Main differentiator is an integrated AC adapter that reduces travel weight.
Dell Austin, Texas	Latitude XP 4100CX	33/100-MHz DX4	$4,799 to $5,099	A lithium ion battery that delivers more than six hours of battery life. Low weight of 6.1 pounds.
IBM PC Co. Research Triangle Park, N.C.	ThinkPad 755 models, including CE and CD	33/100-MHz DX4	$3,499 to $8,149	Built-in answering machine and speakerphone, infrared communications; CD adds a built-in CD-ROM drive.
NEC Technologies Boxboro, Mass.	Versa M/100HC	33/100-MHz DX4	$5,199	A high-resolution screen (800 by 600 pixel) that also comes in a 24-bit true-color version.
Texas Instruments Dallas	TravelMate 4000/M	33/100-MHz DX4	$4,699	Fast SCSI, 16-bit built-in soundcard, optional CD-ROM docking system.
Toshiba America Irvine, Calif.	T4900CT, T4850CT	50/75-MHz Pentium, 75-MHz DX4	$4,949 to $7,500 (Pentium)	Pentium chip, built-in video support.
Zenith Data Systems Buffalo Grove, Ill.	Z-NoteFlex	25/75-MHz DX4	$5,499	Integrated speaker, support for an optional CD-ROM attachment.

* Intel processor unless otherwise noted

So far, the higher phone bills have been more than offset by the millions of dollars Kodak has saved in real estate costs by moving its workers home. The company has also reduced administrative staffing levels considerably and towered the six- to 10-day order processing cycle down to a few minutes — another cost-reducer.

For software updates, the advent of the CD-ROM drive in notebooks may work well, at least for some users. Stamping a CD can cost as little as a dollar per platter, and this low cost may make mailing quarterly updates on disk more affordable than over phone lines.

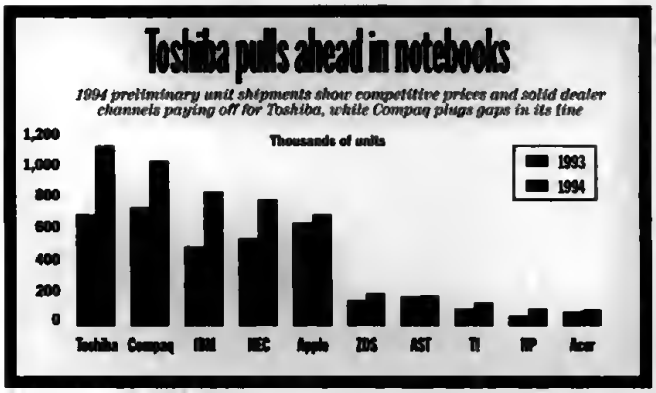
New offerings

In the past six months, a number of software makers have introduced products that take various paths to reduce the amount of data that needs to be sent back and forth. For example, low-end products such as Symantec's PCAnywhere and Traveling Software, Inc.'s Laplink for Windows include synchronization algorithms, meaning that only information that has changed in a given file needs to be sent, and the whole file does not need to be replaced to incorporate a change.

On the high end, TechSmith Corp. in East Lansing, Mich., has introduced a client/server tool that strips transmission-clogging network overhead out of data sent to and from remote users, upping transmission speeds.

Despite these advances in transmission performance, an amount of technology seems able to address the usability and training issues that users face.

"If [our agents] take to the technology, they often fail as agents," says Victor Mutnick, corporate vice president at New York Life Insurance Co. Mutnick says agents can become immersed in the technology and forget they have a real job.



Source: Dataquest Inc., San Jose, Calif.

A similar issue pops up at Kodak as well, Valeri says. "You have to balance how much extra functionality you give the people that really love this thing vs. what happens to the mainstream when you keep making it slicker and slicker. You don't want to leave people behind," he says.

Valeri added that the slicker and more capable the software, the more follow-up training it demands. Training users has been the bane of corporations since the first PCs, and many vendors say mobile users cost three times as much to support as desktop users.

A simple rule of thumb used by Gartner Group, Inc. in Stamford, Conn., is to assume one support person is needed for every 100 mobile users, multiplied by the number of up-front training days.

Gartner's research shows that many companies want to justify their investment in notebooks and design "kitchen sink" applications that are difficult to learn.

The leading notebook vendors are also working on ways to ease training.

"We have to make products much easier to use," says Jim Bartlett, worldwide executive for the mobile computing product line at IBM PC Co.

While declining to give specifics, Bartlett says IBM has been working in the areas of voice recognition and interface design and will announce products to address the ease-of-use issue this year.

Likewise, Steven Andler, director of marketing at AST Research, Inc. in Irvine, Calif., says AST will add software to its notebooks to improve ease of use this year. "Our basic concept is to try and provide ... more of a turnkey communication and connectivity offering for mobile computing users," he says.

Security issues remain harder to solve because notebooks are portable. Most companies use password systems, password-lockable hard drives and limit user access to the corporate database.

Backing up mobile users' files is also a major task. Some data can be backed up when the user logs on to the corporate system, but companies have not figured out a way to get remote users to regularly back up their files.

Analysts say the best way to deal with some of these issues is to make things as easy as possible for the end user. Above all, users should not look for John Wayne to come in and make things right. ■

Fitzgerald is *Computerworld*'s senior editor, mobile computing.

Value notebooks

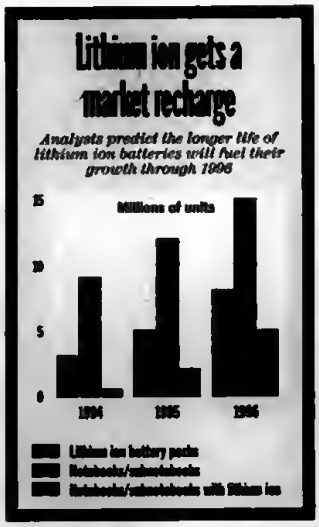
The corporate value line is typically either the high-performance line six months removed or a specially designed product that offers good features but not too many bells and whistles. While the products don't draw as much attention as the gee-whiz high-performance notebooks, this is where the market is in terms of volume. These products tend to weigh a little less than performance notebooks and usually cost less than $3,000.


ZENITH DATA Z-NOTESTAR


GATEWAY COLORBOOK

COMPANY	PRODUCT	PROCESSOR*	PRICE	FEATURES
Apple	PowerBook	Motorola, Inc.'s 33-MHz 68030	$1,469	5.5 pounds, passive-matrix color screen.
AST	Ascentia 810	Cyrix Corp. 33/66-MHz	$2,499	10.4-in. passive-matrix color screen, 5.9 pounds.
Compaq	Contura 410C	25/50-MHz DX2	$2,999	8.4-in. active-matrix color display, 5.9 pounds, 350M-byte hard drive.
Gateway 2000	ColorBook	50-MHz DX2 or 100-MHz DX4	$3,499 to $3,999	16-bit stereo sound, enhanced video performance, up to 720M-byte hard drive, 5.7 pounds, 10.3-in passive-matrix color display.
IBM	ThinkPad 360	25/50-MHz DX2	$2,599 to $3,099	Local bus graphics, external Super VGA port, removable hard drive, passive-matrix color display.
Toshiba	Satellite 1960, Satellite Pro 2400	25/50-MHz DX2	1960: $2,149 to $2,899; 2400: $2,499	1960: White-bread notebook, 9.5-in. passive-color display. 2400: Integrated audio, local bus graphics, SCSI 2 port.
Zenith Data	Z-NoteStar	Cyrix 25/50-MHz DX2	$2,499 to $3,699	Local bus graphics; mouse is incorporated onto the keyboard as part of the J key; 5.7 pounds; passive-matrix color screen.

Battery bedfellows



Although notebooks are challenging desktop PCs in power and feature sets, they still lag in a key differentiator — power source. Mobile computing means running on batteries, and battery life is one of the biggest complaints users have with notebooks.

The good news is that vendors are incorporating new technologies that prolong the battery life of the average notebook, and more promising developments are on the horizon. Here is a quick guide to batteries past, present and future.

All batteries produce energy through chemical reactions among elements. The processor and screen draw the most power from the battery, and active-matrix color notebooks present the biggest power drain of all. Batteries for notebooks are typically proprietary to each vendor, cost a significant amount to replace and must be replaced every 12 to 18 months. Duracell, Inc. and Compaq are trying to create a series of standard battery sizes that would be sold over the counter, just like alkaline batteries.

THE MAJOR BATTERY TECHNOLOGIES

Nickel cadmium. Deposed market ruler. This now-inexpensive technology continues to dominate the low end of the notebook market, but it is no longer the battery of choice for high-end machines. It suffered from a reputation of "memory effect," wherein the battery would gradually lose its ability to hold a charge unless it was completely drained between charges. NiCad must also be disposed of properly for environmental reasons.

Nickel metal hydride. King of the heap — for now. This technology eliminated memory effect and offers slightly longer battery life than NiCad's roughly two hours, although the increase is only marginal. The technology has trouble maintaining the longer life with the high-power draws inherent in today's newer, feature-crammed notebooks.

Lithium ion. The heir apparent in the notebook battery market. Lithium, ironically, was once considered unstable, but it is now viewed as a solid technology. Its vastly superior density means more hours of life per cell, and it has seen claims of up to 18 hours of battery life. Reasonably, lithium ion systems last at least three times as long as older NiCad and NiMH batteries. One factor that has slowed the move to it, however, is supply — at the end of last year, only two lithium ion battery factories existed. These batteries will likely appear only in expensive, high-end systems this year.

Zinc Air. Right now a pretender to the throne. This technology needs a constant flow of air to generate the reactions that create its energy. It works well in hearing aids but gets claustrophobic in the close confines of a notebook. The main supplier is AER Energy Resources in Gainesville, Fla. AER has tried a couple of approaches including a 2-pound unit that attached to the bottom of specific portables. ■

UNDER THE COVERS

➤Apple Computer, Inc. *PowerBook*
It's a Macintosh, which means it's easy to use and sleekly designed, but cost is an issue.

➤AST Research, Inc. *Ascentia 910N and 810*
The 910N is a reasonably solid offering. Its Plug and Play compatibility appears to be a plus, but the rest of the market should be caught up by the time Windows 95 is here.

The Ascentia 810's big screen makes this a good entry offering. Using a non-Intel Corp. chip means AST can charge less, creating a solid-value product.

➤Compaq Computer Corp. *LTE Elite and Contura*
The Elite has stabilized after a series of bugs. It has a small hard drive (510M bytes) and a 9½-in. color screen.

The Contura 410C is a catch-up unit. Basic Contura design has been largely static for two years — one major reason why Compaq fell from the top of the heap in notebooks last year. A serviceable product, but nothing special.

➤Dell Computer Corp. *Latitude XP*
This product is well-liked by reviewers, and it is the best machine on the market for coast-to-coast travel. It has a 9½-in. screen, and its hard drive tops out at a smallish 510M bytes.

Computerworld's product test-drive [CW, Jan. 9] found the Latitude's lithium ion battery ideal for long-distance travel.

➤Gateway 2000, Inc. *ColorBook*
Gateway delivers high-performance products at value-class pricing, but it lacks the support programs of its competitors.

➤IBM PC Co. *ThinkPad 755 and 360*
This product line's integrated CD-ROM and telephony are stand-apart features. The ThinkPad consistently draws top ratings from reviewers. But supply continues to be erratic, and the machines are extremely expensive at the high end.

Computerworld's product test-drive [CW, Jan. 9] found the top-of-the-line 755CD to be noteworthy for its thorough design and feature set. But the $7,599 list price was seen as too steep for the average user.

A value alternative, the ThinkPad 360, is essentially the same as the 750C with a different label and a lower price.

➤NEC Technologies, Inc. *Versa M and Versa V*
The Versa M high-resolution screen is nice, but on a 9½-in. display, characters are small and hard to see. Battery life also suffers because of the screen. But NEC can ship in quantity, a major plus in this market.

The Versa V is a solidly built product that has all the modularity of the original Versa, but this model is pricier than the typical value-class notebook.

➤Texas Instruments, Inc. *TravelMate 4000*
This lightweight marketing company pounds out heavy-duty products. TI always gears notebooks for top performance. The company is due to introduce an Intel Pentium-based notebook with a Peripheral Component Interconnect bus today. It will also include a lithium ion battery and infrared data transfer capability.

➤Toshiba America Information Systems, Inc. *T4900CT, T4850CT, T4800CT, Satellite 1960 and Satellite Pro 2400*
Toshiba's high-end 4800 and 4900 series offer the first Pentium notebooks. The company can supply most systems in quantity, which is a big part of why it holds the No. 1 slot in the U.S. market. The series is a little short on features compared with other products.

The Satellite 1960 is inexpensive after recent price cuts, but it still uses an external mouse, which is anathema to users at this point. The Satellite Pro series is a solid value notebook that shades into high-end performance.



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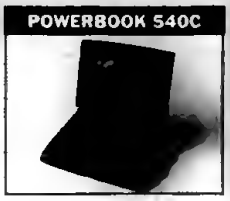
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Improved high-end notebooks leave something to be desired

BUYERS' SATISFACTION SCORECARD

Ratings are based on a 1-to-10 scale where 10 is best. Fifty users were polled per product. The categories are the five designated as the most important by the users surveyed. Average score is the mean of all ratings.









SCREEN READABILITY *Active-matrix screens provided noticeable improvements in readability; larger screens on the IBM and Toshiba notebooks did not make a difference.*	7.4	7.3	7.0	7.2
RELIABILITY *High scores for all — what you might expect from premium systems.*	7.2	7.2	7.3	7.3
VALUE FOR THE DOLLAR *Vendors have not yet found the right mix between functionality and value.*	6.6	6.6	6.7	6.4
PROCESSING PERFORMANCE *Scores indicate users expected more out of these high-end systems.*	7.0	6.8	6.8	7.0
RESPONSIVENESS OF SERVICE *Vendors may promise to ship the system back the next day, but users feel they still need to convey a case of urgency.*	6.9	6.2	6.5	6.8

BY KEVIN BURDEN

Notebooks have come a long way from the days of the 10-pound lug-alongs. Today's high-end notebooks are just as powerful as desktop PCs and include many of the same extras, such as CD drives and stereo sound. But they still have a way to go before users will be totally satisfied with them.

That is the word from 210 users of high-end notebooks, who liked vendors' efforts to improve screen readability and reliability but still want lower prices and better service, especially on the high-performance lines. The products, which were selected based on their market leadership positions, included Apple Computer, Inc.'s PowerBook 540C, Compaq Computer Corp.'s LTE Elite, IBM PC Co.'s ThinkPad 755CE and Toshiba America Information Systems, Inc.'s T4850.

Screen readability

Screen readability jumped from the third most important feature in last year's survey (behind reliability and application compatibility) to the top in this year's evaluation.

The vendors have each made noticeable improvements in this area and scored their highest ratings for this category. All four notebooks have active-matrix color screens with 640- by 480-pixel resolution; the difference among machines is in screen size. Both the IBM ThinkPad 755CE and Toshiba T4850 have 10.4-in. screens, while Compaq's LTE Elite and Apple's PowerBook 540C have 9½-in. screens.

Despite the differences in screen size, the survey results show that size alone does not dictate readability.

"IBM's 10½-in. display is about the best I've ever seen. Toshiba's is not far behind, but IBM's is brighter, with crisper colors," says George Dobbs, technical manager at State and Federal Associates in Alexandria Va.

Reliability

Reliability is even less of a differentiator than screen readability. Each notebook scored fairly high and had similar reliability ratings. "This is about what you would expect for premium notebooks," says Ted Julian, editor of "Gray Sheet" at International Data Corp. in Framingham, Mass.

Value for the dollar

Vendors have done well balancing power and features with portability, considering what the systems deliver for less than 5 pounds, the users said. But vendors still have not nailed the sweet spot between functionality and value.

Every notebook in this evaluation scored poorly for its perceived value for the dollar, indicating users felt either they paid too much or they paid for functionality they did not need.

"IBM appears to have the most work ahead of them here," Julian says. IBM recently made modest price cuts of $400 to $550 in the 755CE, depending on the size of the hard drive, but that might not be enough to raise its perception of value.

"Toshiba makes incredibly tight, solid products. They don't use bleeding-edge technology, but they do use state-of-the-art stuff, and they package it very well," Julian says.

Processing performance

Considering these notebooks are equipped with powerful processors and are something like flagship systems of their vendors' notebook lines, users were not overly impressed with their performance. Both the Compaq and Toshiba machines use an Intel Corp. 75-MHz DX4 processor; the IBM uses the 100-MHz DX4, and Apple uses the Motorola, Inc. 66-MHz 68LC040 chip.

Responsiveness of service

Vendors are constantly improving their service plans, but judging from their scores, they still need to instill a lot more confidence in their customers.

The vendors "understand that most of the people using notebooks are on the road," Julian says. Vendors will ship returned notebooks back to wherever the user says he will be the next day, Julian explains, but it appears that users still need to be firm to get the service they want.

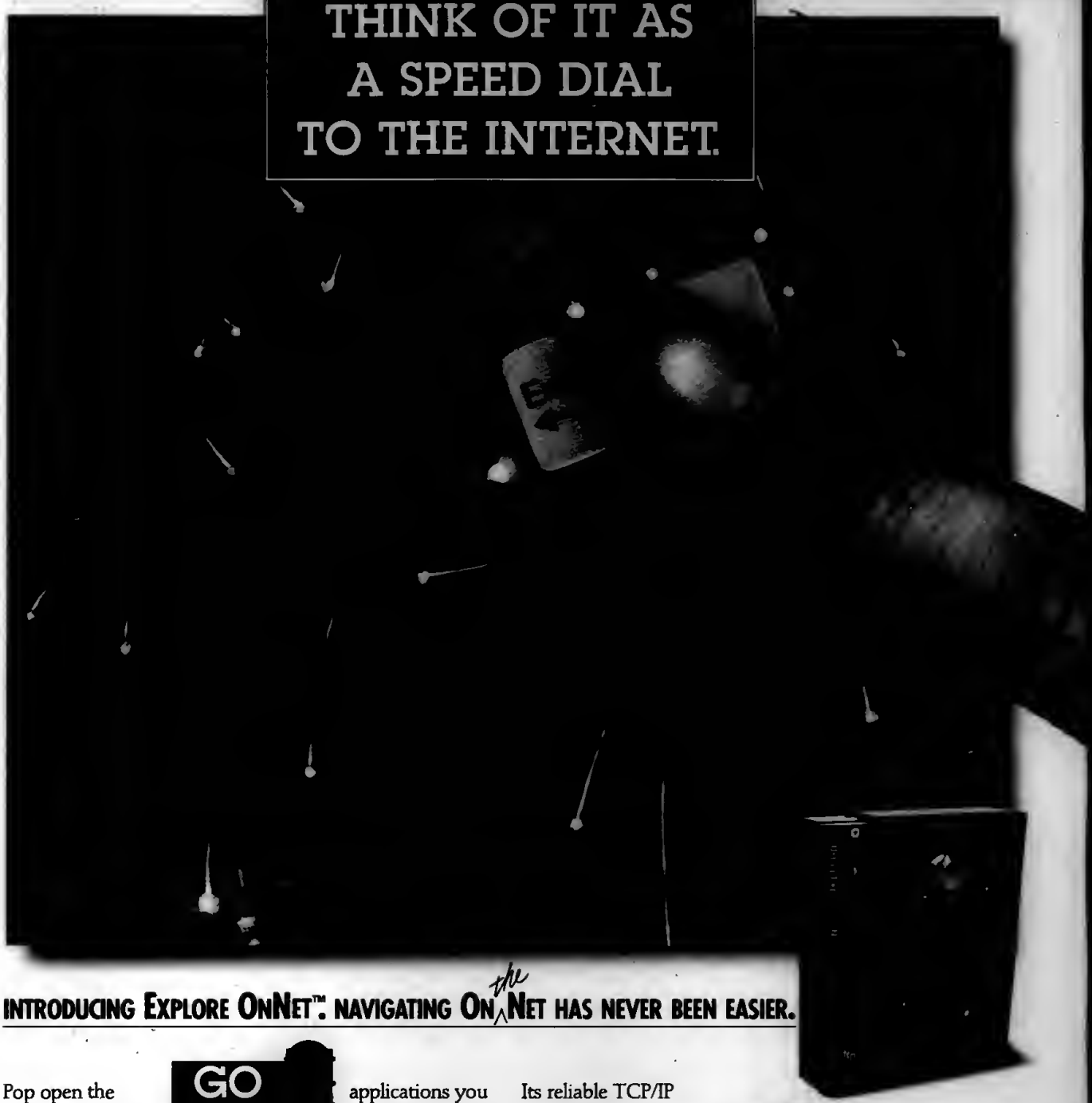
"It took Toshiba two weeks to get our T4850 back to us," says Jeff Rohhins, a systems analyst at the Orange County, Calif., Fire Department. "We didn't need it back right away so we didn't push them, but all they needed to do was install a hard-drive bracket."

Compaq's support received the highest ratings in the Scorecard, though one user knocked the company's service abroad.

"It was tough to get any kind of response from Compaq overseas, while we had no problem getting service for our Toshiba," says John Konen, computer operations manager at Raytheon Engineers and Constructors, Inc. ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

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NEC Versa M: High resolution, low battery power

FIRING LINE

Ratings are based on a 1-to-10 scale where 10 is best. Ratings represent the averages from 51 NEC Versa M users interviewed in the Buyers' Satisfaction Scorecard survey. Average score is the mean of all ratings.

SCREEN READABILITY *An optional ultra sharp 800- by 600-pixel resolution wins approval but drains the battery fast*	7.5
RELIABILITY *Users said they expected and received a highly reliable system*	7.3
VALUE FOR THE DOLLAR *Its high price left users feeling they paid in full for every function*	6.7
PROCESSING PERFORMANCE *Speed of the Intel DX4 75/100-MHz machine was top notch, but users felt battery life claims were inflated*	6.9
RESPONSIVENESS OF SERVICE *A three-year warranty covers all parts, but after the first year, users have to pay for NEC's premium response program*	6.3

Versa M



Versa M's most noticeable refinements include a new front-mounted trackball and a removable/reversible high-resolution display

NEC Technologies, Inc.
Boxboro, Mass.
(800) 388-8388

NEC responds:

Battery life
NEC plans to use new battery technologies, such as lithium ion batteries, to address the battery life problem in future generations of its 800- by 600-pixel resolution notebooks.

Value
New technologies tend to be more expensive than older technologies, and Versa M uses a number of them, including breakthrough display technologies, fast processors and fast cache. These technologies will become less costly in time and will drop prices further than the 5% to 11% price cuts announced earlier this month.

BY KEVIN BURDEN

Notoriety in the crowded notebook market is hard to achieve, but NEC Technologies, Inc. has arrived at a unique place by producing Versa M, the highest-resolution notebook available.

Just how critical is resolution? According to the Buyers' Satisfaction Scorecard survey of 261 notebook users, screen readability is the most important feature. Fifty NEC users in the survey rated Versa M highest for screen readability.

Versa M also sports some ergonomic improvements such as an integrated trackball located on the front of the chassis. Older Versa lines used detachable side-car trackballs that attached to either side. NEC also redesigned the AC adapter, turning the old heavy transformer into a 6 oz., cigarette-pack-size plug.

This Firing Line features in-depth interviews with four evaluators: a utility company, an association, a retail chain and a manufacturing company.

The format for this evaluation was created with assistance from Howard Rubin Associates and Technology Investment Strategies Corp.

Screen readability

The versatility of the Versa M starts with four active-matrix display choices. Two versions offer a full-color display with 640- by 480-pixel resolution and 65,536 colors; a true-color model offers the same resolution but shows 16 million colors; and a high-resolution model displays 256 colors at 800- by 600-pixel resolution. Evaluators of each display type said the system provided enough screen adjustments for all lighting conditions.

Association: "You can adjust the contrast with a slide next to the screen and the brightness intensity through a keyboard command. There are enough pitch adjustments to make the screen readable no matter what the light, no matter what the angle."

The high-resolution model provides the sharpest picture of the four options, but the number of firing pixels gives it the shortest battery life.

Association: "We have both a high-resolution and true-color models, and the high-res doesn't have near the battery life of the true-color."

Reliability

At the time of the interviews, only one evaluator had experienced a failure. It occurred when a hard drive that had been swapped out of another NEC Versa model failed in the Versa M and had to be replaced.

Aside from that episode, evaluators had yet to experience any significant problems and retained high confidence in Versa M's reliability.

Value for the dollar

Even by high-end notebook standards, Versa M might be considered pricey. The line starts at $5,099 for the 75-MHz full-color model and goes to $6,799 for the 100-MHz high-resolution model. Although none of the evaluators said they paid too much, none said they felt they recieved a bargain either.

Utility company: "When you include everything it comes with, like its warranty, service and the long life it might have in our company, we feel that we got a great deal."

Association: "Nothing comes for free in this system. It has a lot of flexibility and great technology, but we paid for every piece of it."

Performance

To support the processing needs of power-drawing multimedia applications, Versa M uses Intel Corp.'s DX4 processor with a choice of either 75-MHz or 100-MHz speeds for each model class. Users said they were generally satisfied with Versa M's processing performance but could not help commenting on a recurring notebook peeve: battery life.

Manufacturing company: "When NEC says it has a four-hour battery life, I expect it to be four hours regardless of what I'm doing. But they apparently mean four hours if you don't constantly write to the hard drive or put it through the paces of normal work."

Support

The evaluators commented favorably on NEC's warranty and support quality. Versa M comes with a three-year return-to-factory warranty and one year of free UltraCare. UltraCare includes 24-hour/seven-day response and a promise that any system sent to the service depot will be returned within one business day of its arrival.

Manufacturing company: "We sent back one [Versa M] that had a hard drive failure on a Thursday. We had a whole new system by Monday."

Expansion

The evaluators were also pleased with Versa M's expansion options and ease of expansion.

Utility company: "Unlike the Toshiba 4700 we also bought, you don't need a screwdriver to remove the hard disk. The NEC releases the hard drive with two compression buttons — you just pull it out and snap a new one in."

Manufacturing company: "I have several hard drives, each configured with a different operating system. If I need to show someone an OS/2 application, I just snap in that hard drive — if it's Unix, I snap in that one."

Memory upgrades use the same snap-in/snap-out procedure and were said to be just as easy.

And although evaluators said they will probably not need all the expansion options available through VersaBay, a standard slot that accepts optional VersaPaks, its presence adds to the notebook's versatility.

VersaPaks include a Video Pak that receives television broadcasts, a Smart Battery Pak for additional uptime and a PCMCIA Pak that adds to the machine's two internal PCMCIA slots.

Retail chain: "Having an extra battery is a benefit that needs no explanation. I'm not sure if we will ever need the others, but they're options that could keep [Versa M] around for a while." ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

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70 Mining/Construction/Petroleum/Refining/Agric
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12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer
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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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ATM is NOT ready



STELLA JOHNSON

Kruk is officer of telecommunications at Sun Life of Canada in Wellesley, Mass.

BY John V. Kruk

You're nobody 'til somebody loves you.

Asynchronous Transfer Mode (ATM) is a nobody because it doesn't have the applications behind it to make it a real force for my business. Couple the lack of applications with ATM's expense, missing standards and dicey availability and you've got some sound reasons to wait to move to ATM.

For now, we'll stick with private frame relay for our wide-area network, which connects two of our three Boston locations as well as our office in Wellesley, Mass., and two of our Canadian offices.

Don't get me wrong. I would change my thinking in a heartbeat if applications to remote sites such as mainframe core transfers and LAN backup as well as desktop video and imaging were available. These are the applications that will catapult ATM from nowhere to stardom.

In a way, I think ATM suffers from a chicken-and-egg dilemma that has as much to do with users as it does with the missing pieces of the technology itself. Users don't have the incentive to develop the applications they need to embrace ATM unreservedly, and because users aren't embracing it, vendors don't have the incentive to produce the missing pieces that users would love. This situation is very similar to where Integrated Services Digital Network (ISDN) stood six years ago, when there were very few applications to support ISDN as an emerging technology. Certainly a vicious cycle.

No, *page 106*

SOUND OFF!

IS ATM READY FOR PRIME TIME?

☞ At issue: Asynchronous Transfer Mode (ATM) technology has been touted as the fix for network traffic problems. It promises to deliver bandwidth on demand and handle video, data, voice and images easily. That's why our ATM proponent is hot on the technology. But the lack of applications and high costs are keeping another IS chief away.



STELLA JOHNSON

Boyd is chief technologist at Northeast Utilities System in Berlin, Conn.

ATM is ready

BY Stephen W. Boyd

My greatest fear is to stand up in front of my corporate management and admit: "We knew all about the promise of ATM back in '94-'95 and did nothing to prepare ourselves for it."

That's why we are moving aggressively to put Asynchronous Transfer Mode (ATM) in place in our organization right now. We are building our own fiber backbone throughout New England to capitalize on wide-area ATM.

We have always been a company at the forefront of networking technology. For instance, Northeast Utilities System's private frame-relay network, which has been supplying 1M bit/sec. burst capability to our 80 New England sites for three years, was in the works before some companies even knew what frame relay was. Today, lots of frame-relay wanna-bes who have come late to the party are having to wait months to get at the technology because of the backlog from service providers.

By the time they get into frame relay, we will be well into ATM and reaping the benefits. It is foolish to wait until the path is clear and the road is on its second paving to move to new technologies.

That's why we have ATM in use for T3 traffic between our biggest sites and high-traffic areas. On-line training, video libraries and corporate data synchronization and backup from the desktop world mandate switching at sites with more than 300 people. We're now testing the addition of ATM switches to mitigate campus congestion in workgroups and enable virtual LAN segmentation. Frame relay will continue to exist in our smaller sites.

We are not wasting time installing switched services that do not support our strategic ATM plans. We do not have the staff or the budget to upgrade hub equipment every two or three years just to move to switched shared media topologies instead of going directly to ATM.

The time is ripe for corporations to move to ATM. In the next 12 to 18 months, networks are not going to be able to take what we throw at them anymore. Shared

Yes, *page 106*

No

Continued from page 105

I think of it this way: I wouldn't jump out of a plane on my own. However, if someone told me the plane was on fire and my only chance of survival was to jump — look out! I'd push the pilot out of the way to get to the exit.

To jump, users need a reason: useful business applications. Without those applications, users can easily dwell on ATM's drawbacks.

Most financial institutions tend to be conservative — some people would say overly so. But would you call us too cautious in trying to protect Sun Life of Canada, with its $66-plus billion in assets, from jumping on the ATM bandwagon, considering that the wagon is barely patched together, has no wheels and no driver and charges too much for a ride?

The investment involved in moving to native ATM is staggering. Experts peg ATM costs at anywhere from $5,000 to $20,000 a port, with the high-end costs including equipment, network management, testing and training. Using that sliding scale, our current 15-port setup would cost us between $75,000 and $300,000 a port using ATM. Currently, we spend about $3,000 per port for frame relay.

Items such as network interface cards (and there are few of these hardware pieces out there) cost lots more than comparable network hardware. For instance, a network interface card for fiber optics costs about $1,000, while an Ethernet board costs $150 and a top-end Token Ring card about $400.

> Users need a reason to jump to ATM, and that reason is compelling, useful business applications.

And "little" things such as network management barely exist for ATM networks. Traffic and congestion management and standards continue to be a joke. For instance, what happens to my data if I exceed my bursting rate? Right now, with frame relay, I've got to throttle back on occasion or trash my data. Is it the same with ATM? No one seems to know.

LAN emulation standards are also murky. It is encouraging to hear that there are standards in the works to help frame-relay users migrate to ATM easily, but my guess is that finished standards are still years down the road.

In the WAN environment, I can use speeds of 1.5M bit/sec. with frame relay. If I need higher speeds, I will need ATM. However, I will also need T3 access, which allows connection between the local telephone company and our building. This poses both money and time constraints in that short-haul T3 access costs about $10,000 a month plus a six-month install time, making it fourth-quarter 1995 before I can even start alpha-testing for the ATM application.



Nor have ATM backers convinced me that security in the WAN environment is any better with ATM. Misrouted or lost traffic is a recurring problem with switched protocols such as ATM. Actually, the ATM protocol might be more secure than frame relay in that fewer people use it.

In the end, all the technical issues may come down to one thing: Do you have people on staff or reliable integrators who know what they're doing and can deal with any problem? Because there's no ATM yet, few technicians are "ATM-ready." The cost to bring people up to speed will likely be hefty.

I've got a message for ATM: Prove to us that you are a nonproprietary networking solution and prove the solution is real and not just a matter of swapping one set of problems for another.

When you do this, the user community will adopt you, and you'll become a somebody. ■

SOUND OFF!

Yes

Continued from page 105

media LANs, Ethernet and Token Ring nets are going to be overrun.

For instance, next year we expect to bring on board 2,200 multimedia-ready 90-MHz Pentium-based PCs and Sun workstations and increase our nontraditional multimedia LAN traffic. We will soon have to handle video servers feeding information to workstations at 1.8M bit/sec. Ethernet is not going to hold up under the strain of two or three people (let alone an entire team or unit) getting interactive training from these servers. Add to that scanned images (after all, we want to reduce paper handling) and LAN-based, high-quality videophones, and all of a sudden a 100M bit/sec. Ethernet "solution" looks as slow as molasses.



But moving to ATM is not necessarily about speed, nor is it about its ability to deliver data at a rate of 155M bit/sec. That's not its value. (If speed for the sake of speed were the goal, then we would all be moving to Synchronous Optical Network, or Sonet.) ATM's strengths are in its scalable transport management and end-to-end signaling for discrete circuit use. These features will enable companies to get maximum value from the current limits of physics and copper.

> We have to move . . . to ATM before we do irreparable damage to our business.

More important, ATM will enable firms to return to some of the efficiencies that a centrally controlled network can offer. Departmental LANs consume a tremendous amount of corporate resources, with a typical decentralized architecture costing as much as five times more than a centralized one. Some of the high cost is attributed to the fact that accountants, lawyers or other end users may be acting as LAN administrators.

It may not be politically correct to say, but ATM will return networks to central IS control by moving servers back to the glass house. This will strengthen security, make corporate data more easily accessible and help trim the corporate body count.

Think of the savings when you don't have to pay for hundreds of servers and their backup facilities and personnel and software licenses. Centralization can be justified only when communications costs become less than the distributed operational costs. This crossover of costs is about to occur for distributed servers because of ATM switching technology.

ATM has received a bad rap because there are few ATM desktop applications. Applications are not being developed for the ATM desktop because there are not many ATM networks to the desktop.

But the lack of applications is not holding us up. There is plenty of value in ATM as a transport switch fabric right now. We're concentrating first on our campus ATM infrastructure. ATM switches campuswide will enable Northeast Utilities to manage the flow from legacy LANs to ATM switched LANs and, ultimately, to ATM-attached desktops.

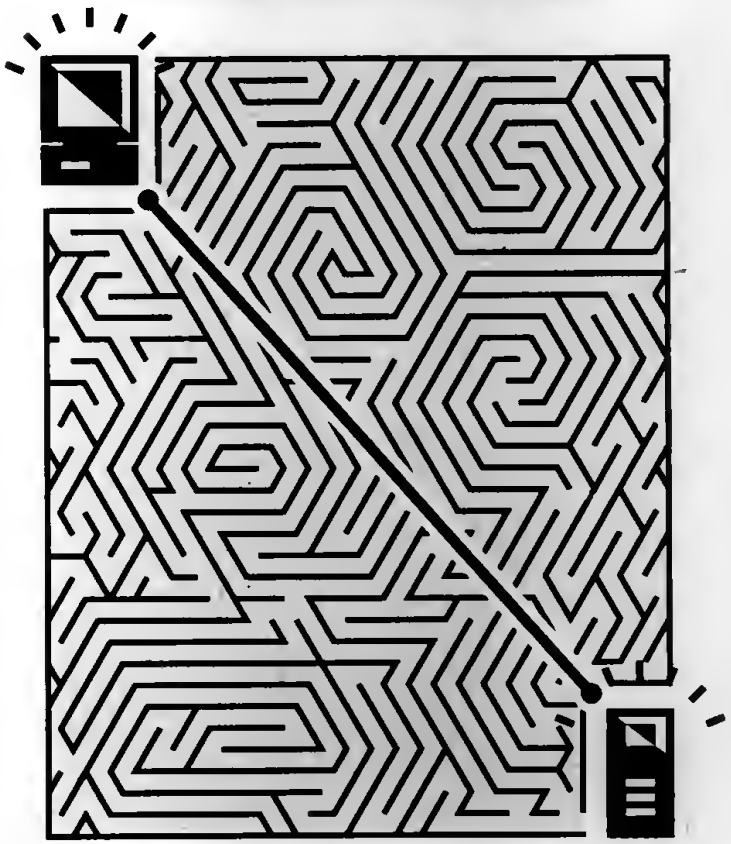
We are starting to train our IS staff now in the skills needed to install, manage and develop applications that can unleash the potential of a world in which multiple private connections will be managed over a single physical transport connection.

Training is not cheap, but why not invest in your people now and have the best tools to run your business?

I am concerned not about being too early but too late with ATM.

The time for prudent network designers to incorporate ATM into their plans is now. Now is the time to position legacy LANs for the efficient transformation to ATM. ATM is not as far off, or as dangerous a trek, as ATM-phobes would like you to believe. ■

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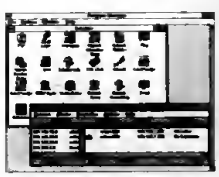


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FEELING

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JOSEPH POLLIZZI, *project engineer, operations software branch, science and engineering systems division, Space Telescope Science Institute, Baltimore*

"Quality work that goes into production quickly and works the first time gets my attention right away. Innovation [does, too]. If someone has attacked a problem in a new way or evaluated a new technology, explored ways we can use it and has managed to do their regular work at the same time, that comes up high on my list.

"Also, we all suffer from the problem of information overload. As managers, we tend to take a hunker mentality — there's so much to do that we tend to lose touch. So I encourage my staff to come in and talk to me. Not about anything specific but whatever they want. I want employees to come to me not just with problems but also with, 'Hey, I just read about this, and it sounds interesting. Have you thought of it?' Or if they offer to help offload some of my work, that brings them to the forefront for my consideration.

"Often, good, innovative solutions are sitting in people's minds that just never surface. We've lost the ability to sit down informally and talk, and that's often where the best solutions come from. So establish a dialogue. You may have the solution to a manager's problem."

MARC RETTIG, *senior architect for Project Eagle, technology services group, Andersen Consulting, Chicago*

"In general, we have internal mechanisms for communication. We use Lotus' Notes heavily. After a while, you start to remember someone who posts consistently thoughtful, well-stated comments on some strategy or technology. Also, with Notes, you see the person's name but not their title, so it creates a more level playing field than the conference room, where politics come into play.

"Recently, [some] people in my group came to my attention as being above average. One person took the initiative to think about work from the group's perspective vs. her own. [For example], if I said we should add this feature or start building communication with this other group, she would often respond that she had already anticipated that or scheduled a meeting to arrange that. I could tell by her responses that she was thinking beyond the scope of her specific assignment. That gives me confidence that I don't have to be managing this person all the time and things will be taken care of.

"On another occasion, a programmer came to me and said, 'I'm not happy anymore with the code I wrote six months ago when I started this project. I'd like to schedule a code review and ask permission to rewrite the code.' Code reviews aren't an official part of our methodology, so I knew she cared enough about her work that she was trying to do the right thing. And she recognized that getting other people involved was the right way to do that. She showed initiative."

PAM ADAMS, *manager of customer services/open systems, Kash n' Karry Food Stores, Inc., Tampa, Fla.*

"Tooting your own horn always works. The squeaky wheel gets the grease, so start creating notoriety among your peers. Talk to them about what you're working on. The word won't necessarily get up to the boss, but when you go to the boss to present what you've accomplished, you'll be more at ease. Talking to your co-workers is like a dress rehearsal.

"You have to be proactive about showing your contribution. Set up a meeting to show what you're working on and what you've accomplished so far.

"Also, ask your boss: 'What are your issues; what are things you have to resolve that I could help with?' Take an interest in your boss's concerns because they're the business's concerns."

MARK SUCHMAN, *systems analyst, Aeromexico Airline, Houston*

"The most important thing you can do is take on more responsibility. For instance, take on your manager's administrative duties — those things that fall through the cracks. We're a small shop and typically a lot of system administration types of things are overlooked, such as culling old files, reorganizing older files. I try to just take care of those things and then point it out later.

"Deal with users for your boss, organize their requests, take care of problems, and don't just drop them on the boss's desk. Be a buffer for your boss on the front lines.

"In a training course [I took] on servicing clients, one of the most important

Feeling invisible, *page 111*

Data Processing

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Feeling invisible

CONTINUED FROM PAGE 110

points was, 'Always exceed your customers' expectations.' I think you can apply that approach to getting your boss to notice you exceed his or her expectations."

TOM WONDRA, *information services manager, consumer paints division, Valspar Corp., Wheeling, Ill.*

"Do something that adds to the bottom line or in the business side of things, something that [shows] you're not just a techie. Develop a program that reduces an order cycle or eliminates paperwork — something that increases productivity. Helm a project that will help reduce head count.

"Customer service is really important. Everyone you see is your customer. Make sure your department takes care of them. If you're having trouble, they can't get their jobs done. So make people feel like you're talking their language and that you are there to service them.

"Unfortunately, if you're doing your job well, no one hears about it. Let [management] know things are going well with status letters. If you can help a department with its productivity, you can take that to your boss and say, 'I'd like to do this in another department — here's what I did.' Because it will take more than just you to improve a process, you'll need a team. So by taking the team approach and giving recognition to the team, you'll draw attention to yourself as well."

JOHN CHALLENGER, *executive vice president, Challenger, Gray & Christmas, Inc., Chicago*

"It's essential to find ways to be part of major projects and then let people know about [your] accomplishments. Most people hide what they have done.

"You can gently boast in many ways. If work is coming up that is relevant to what you've been working on, use it as a way to frame your accomplishments: 'Here was the situation, here are the steps I took, here were the results, here's what I could do for the new project.'

"Get along with your immediate supervisor. Help that person with [his] projects. Get along well and you will get the fun assignments; you'll be recognized for what you do. I'm not talking about brownnosing, but about finding ways to get along authentically."

CAROL RAY, *manager of end-user computing, Lower Colorado River Authority, Austin, Texas*

"My most infamous action to get attention was standing on a chair in a meeting, waving my hands over my head and yelling, 'Listen to me!' You can't do that often, but I got to say my piece.

"It's a real sign of professionalism when you know when to escalate an issue. You don't want to be small or petty, but sometimes you've got to bring management's attention to something.

"I tell my staffers to line up at my door, post things to my monitor, use my pager number and my cellular phone. But I want them to use the right words: This is important. This must be done.

"Help keep me abreast of customer requests. We try to operate on the basis of no surprises, so keep me informed on what customers are upset about."

BOB CERNY, *manager of client/server systems, Elkay Manufacturing Co., Oakbrook, Ill.*

"Coming up with an improvement in service that would increase customer satisfaction among your users always attracts notice. We surveyed our customers and determined that they were dissatisfied with the business systems that we deliver and the speed at which we deliver them. If a staffer saw some new tools and could recommend that a new one be put in place and could show how it would reduce our cycle time and help build more flexible, capable systems for users, that would be really well received."

JUDY HUBER, *director of finance and information resources, Arden Courts, a division of Manor Health Care, Silver Spring, Md.*

"Make sure you aren't getting negative visibility. You have to perform well in your job, keep people informed and make your deadlines. Before you create visibility, you have to have something you want to create visibility for."

Information systems "has a lot of internal customers, so doing status reports for your boss is one way of creating visibility. You're probably providing service to lots of people, and if you don't state those services, those customers probably aren't aware of what you do. So present your boss with a report on what's lined up, what's completed and what's in progress.

"In IS, the objective is not to be called, so if you're doing your job right, no one notices. Your boss only hears about the problems, so make sure he knows what you're doing.

"Develop your networks. Know who your boss is talking to and let them know what you're doing. But when you put out the word, make sure you're doing a good job before you draw attention to it.

"If you're starting to see a deadline slip, call the person ahead of time and ask what will happen if this is late. The flip side to more visibility is that you're putting yourself out there for more evaluation. So make sure you have your own performance issues in line." ■

Goff is a freelance writer in New York.

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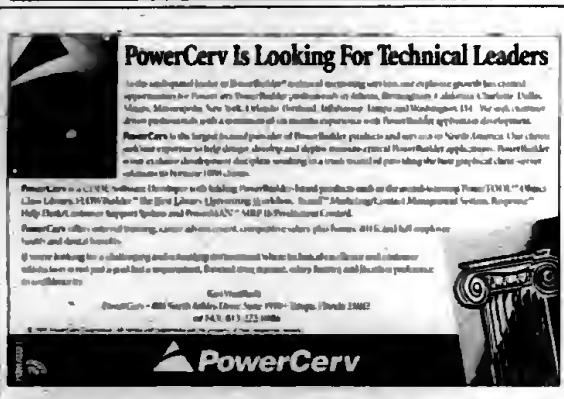
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UNIX Kernel Software Development

Applicants must possess knowledge of the UNIX SVR4 kernel, real-time functionality and performance and related operating system concepts. Any experience with the UNIX kernel and/or multiprocessor concepts and performance tuning will be considered, as will microkernel-based experience. Degree (or equivalent) in applicable discipline and 2+ years of relevant experience also required.

Compiler Software Development

Chosen candidates will develop common code generator technology for compilers using state-of-the-art code generation and optimization methodologies. Must possess experience with compiler technology. Knowledge of code generation, optimization and Power PC RISC architecture a definite plus. Degree (or equivalent) in applicable discipline and 2+ years of relevant experience also required.

SALES/MARKETING PROFESSIONALS

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Marketing Managers

Selected applicants will analyze/qualify potential customers and product needs, determine markets and recommend promotional activities. Must possess the knowledge to be active in research, data base management, program generation, competitive analysis and win/loss analysis. Previous exposure to the computer industry and a strong technical background also essential. An MBA would be a plus. Salary to $60K.

Marketing Communications Specialist

Chosen candidate will generate newsletter articles and product marketing literature (from writing through design and production). At least three years of high-tech marketing experience is required, as is a strong understanding of computer terminology and applications, desktop publishing, graphic design and production. Previous experience with trade shows, media relations or advertising also helpful. BSCS a plus. Salary to $45K.

To be considered for any of the opportunities listed above, please submit your resume, indicating position of interest, to: R. Thomas Welch, Harris Computer Systems Corporation, Dept. CW/0227, 2101 W. Cypress Creek Rd., Ft. Lauderdale, FL 33309. Equal opportunity employer M/F/D/V.

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DUTIES: Develop state-of-the-art capabilities and enhancements for Geometric Modeling (Solid Modeling) software package as a part of a commercial Mechanical Computer-Aided Engineering (MCAE) system using C and FORTRAN programming languages. Responsible for requirements definition, algorithm design, software implementation, internal software documentation, software integration, bug fixing, and quality assurance of Solid Model generation and modification functionality such as Boolean and Fillet. Perform appropriate literature surveys to ascertain state-of-the-art approaches to the problems involved. Prototype software to evaluate design concepts, implementation techniques and data structures. Utilize structured programming techniques in software development. Develop major routines and utility programs with minimum supervision. Interact with other members of the technical staff to determine the development requirements to support and integrate all needed functionality. Review and critique competing software products. All of the above responsibilities apply specifically to the development of geometrical/topological algorithms in a Precise Boundary Representation Solid Modeler using Non-Uniform Rational B-Splines (NURBS).

EDUCATION: Bachelor of Science or Bachelor of Technology in mechanical, aeronautical, aerospace, civil, electrical or computer engineering, computer science, physics or mathematics.

No experience in the above duties but applicants will qualify with three years of experience as described hereinafter. Three years of experience in the job described or three years of experience involved in the development of mechanical engineering software for geometric modeling is required.

The three years of work experience required of the holder of the bachelor's degree must be in the development of a large (greater than one million lines of source code) commercial Solid Modeler. The software must be written in the C or FORTRAN language. The applicant's personal contribution must include the following:

(a) Must have worked on a Non-Uniform Rational B-Spline (NURBS) based precise boundary representation (B-rep) Solid Modeler. Must have written at least 5,000 lines of source code to implement global and local modification operations (generalized Draft, Shell, Boolean or Fillet) of precise B-rep models, and

(b) At least 2,500 lines of source code using computer science principles. The principles must include computer graphics and data structures.

The same lines of code can satisfy any of the above subject areas.

The employer will accept, in place of the bachelor's degree and two of the required three years of experience, a master's degree in any of the indicated fields provided the graduate work included:

(a) At least 10 semester hours or equivalent quarter hours in computer applications with emphasis on the use of B-spline geometry, interactive computer graphics, graph theory, data structures and analyses of algorithms. Any single course may satisfy two or more of these requirements.

(b) At least 6 semester hours or equivalent quarter hours, in addition to the 10 semester hours described above, of research resulting in a computer program (at least 2,000 lines of code) with emphasis on B-spline geometry and computer graphics.

The one year of work experience required of the holder of the master's degree must be in the development of a large (greater than one million lines of source code) commercial Solid Modeler. The software must be written in the C or FORTRAN language. The candidate's personal contribution must include work on a NURBS-based precise boundary representation (B-rep) Solid Modeler. The candidate must have written at least 3,000 lines of source code to implement global and local modification operations (generalized Draft, Shell, Boolean or Fillet) of precise B-rep models.

Completion of all master's degree requirements except thesis defense is considered equivalent to receipt of degree.

All applicants must read, write, speak and understand English.

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SALARY: $39,140 to $45,000

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Programmer/analyst for provider of long term healthcare located in central Ohio. Job duties: design & develop software programs; provide ongoing database software & enhance existing programs with new applications; work with concurrent parallel programming issues; windows applications development & client server technology for remote data transfer & integration; debugging & implementation to problem solutions using: Greedy method, dynamic programming & least cost branch & bound; computer networking & designing compilers. Tools used: Data General computer under Unix & Universe (PICK) operation systems. C & C++ languages as well as other languages with windows & DOS operation systems. UNIX semaphores, shared memory use & implementation for concurrent & parallel programming. TCP/IP Ethernet communication protocols, client server technology BISON, YACC, LEX & FLEX tools, writing queries in both SQL & QBE, windows & Magic software as a CAD tool. B.S. in Computer Science, 1 yr. exp. in job described or 6 mos. exp. as computer consultant with exposure to different computer systems and 6 mos. project or work exp. designing, simulating, programming & debugging the protocols for information security in communication networks. Must have hands on ability with tools used. If no Data General, then at least 2 other systems under UNIX & WINDOWS as verified by employer or employer testimonial. Ability to program & analyze with these techniques: Greedy method, Dynamic Programming, Least cost-branch & bound as demonstrated by project in employer or professor testimonial. Educational background to include 1 course each in data communication, simulation & modeling and operating systems. 40 hrs./wk. 8am-5pm Mon-Fri. $25,000.00 yr. Send 2 resumes & cover letters (no calls) to: J. Davies, JOB#00911, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216

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SYSTEMS & DATABASE SERVER

The ideal applicant should have an AS/BS or equivalent in Electronics, Electrical Engineering, Electrical Engineering Technology, Computer Science or Management Information Systems, in addition to 2+ years' hands-on experience troubleshooting Compaq or compatible products. Familiarity with PC and server architecture, as well as hands-on experience diagnosing and troubleshooting Network Operating Systems or RDMS software issues is essential. Expertise with one of the following systems or applications is required: Oracle, Sybase, SQL Server, Novell NetWare, Banyan Vines, Microsoft NT, IBM LAN Server or SCO UNIX. Direct customer support experience in a multi-vendor, connected environment and excellent verbal/written communications skills are essential. **Dept. CKS-CW-0227-TSEC, MC 110503, FAX (713) 374-0080**

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This position provides programming support and technical expertise to develop, implement and enhance systems for organizing and distributing large amounts of information in multiple formats, constructs and forums (Document Management Systems). Qualifications include a minimum of 3 years of programming experience, as well as 1+ years' experience in Document Management Systems implementation which includes document markup languages such as: SGML or HTML.(SGML is essential), software selection, data analysis, formatting macros, databases, parsers and document type definitions. Experience in a publishing environment is desirable. Project management skills are preferred and excellent verbal/written communication skills are essential. A Bachelor's degree or related equivalent experience is required. **Dept. CKS-CW-0227-SP, MC 110503, FAX (713) 374-0080**

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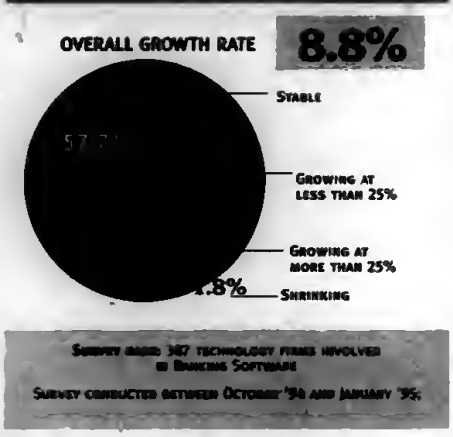
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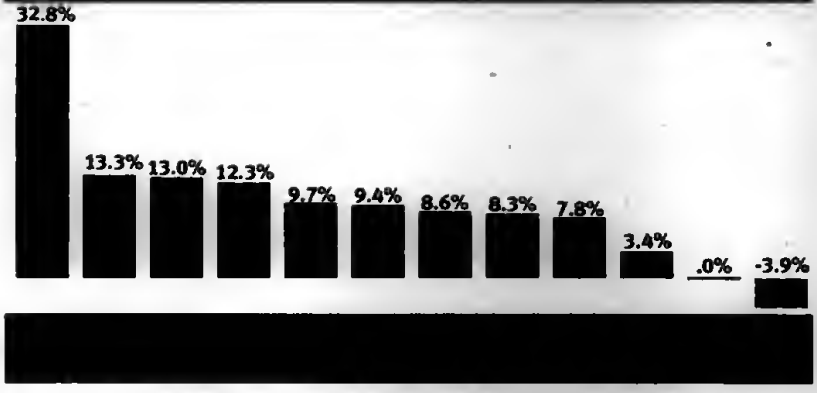
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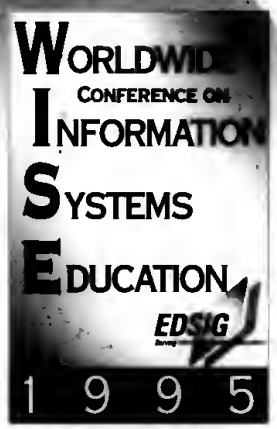
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Jason K. Whitehair
Recruiting Manager/Systems Engineering
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Having just celebrated its 25th anniversary and exceeding $10.6 billion in revenue, MCI is not only the nation's second largest long-distance provider, but also the world's fifth largest carrier of international traffic. Because the Systems Engineering Division plays a strategic role in shaping MCI's technological future, Recruiting Manager Jason Whitehair relies heavily on *Computerworld* to help recruit leading-edge professionals.

"Dedicated to delivering premier customer service and the highest quality products, Systems Engineering provides systems and software development and support to all of MCI's domestic and international voice and data businesses. Everything from message processing and commercial billing ... to network management and control ... to MCI Mail ... and more. Take our Friends & Family program, for example. Our software applications are what keep track of millions of 'calling circles' and generate customized bills.

"Not limited to any one platform, we utilize the platform best suited to deliver each customer service. So I'm always looking to recruit systems engineers with at least five to seven years of experience in a wide range of technical environments. Because *Computerworld* is one of the best trade publications for staying on technology's leading edge, its readers are the professionals we're generally looking to recruit. When it comes to recruitment advertising, *Computerworld* delivers a much higher ratio of qualified candidates than daily newspapers or nontechnical publications.

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A software developer based in Chicago, cfSOFTWARE has been providing communications solutions to computer professionals in the IBM and compatible arena for over a decade. Because *Computerworld* appeals to a large base of both mainframe and PC professionals, Vice President Mary Cooper just recently expanded the company's *Computerworld Direct Response Card* advertising to include all three of their communications products.

"To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we've also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That's why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

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Marketplace

Question of the month

▶ What should you keep in mind when buying client/server development tools such as Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder?

We want your advice on this month's question. Please send responses to jnaze@cw.com or fax Jodie Naze at (508) 875-8931.

There's no reason to consider a monochrome notebook as a desktop replacement. Economies of scale are forcing the cost of active-matrix color screens down, making color more affordable.

Your next notebook

By Alan Radding

By year's end, the zealous bargain hunter may discover them collecting dust at a low-end discount store, but for the most part, monochrome notebook computers will be as scarce in sales channels as Commodore machines.

Mass production and market forces combined with technological advances mark the monochrome's end. Moreover, the price of thin film transistor (TFT), active-matrix color screens has dropped into the $600 to $800 range, says Randy Giusto, director of mobile computing at BIS Strategic Decisions in Norwell, Mass.

This price drop, in turn, has forced down the cost of dual-scan, passive-matrix color notebook screens to the point where there is little difference in price between a passive-matrix color notebook and a monochrome model.

Market momentum puts the final nails in the monochrome coffin. The cost of dual-scan, passive-matrix notebooks is dropping below $2,000, and active-matrix systems are breaking below the $3,000 level. Demand for color notebooks increases as would-be monochrome notebook buyers opt to pay slightly more for color. This allows vendors to leverage economies of scale to drive down the cost of color notebooks even further.

Because of the decrease in volume — published reports project monochrome notebook volume will drop to fewer than 200,000 units from a peak of 1½ million in 1992 — monochrome notebooks could actually end up costing more than color notebooks if they remain in the market.

"The market is moving to 100% color in the next year," says David Mack, vice president of research at WorkGroup Technologies, Inc., a Hampton, N.H., technology research firm.

"The changeover is done. Vendors are dropping monochrome notebooks from their product lines," says Ted Julian, a PC hardware analyst at International Data Corp. in Framingham, Mass. Any monochrome machines still on the shelves reflect vendor efforts to clear out inventory.

Cleaning house

In a recent review of advertisements for notebook computers, only one vendor, Compaq Computer Corp., was actively promoting a monochrome machine, the Contura Aero, priced at $1,199. But that also appears to be nothing more than clearing inventory; the Compaq notebook line is due for a major overhaul, with the Contura Aero models targeted for a complete revamp [CW, Jan. 23].

With a price difference of about $500, it makes little sense for users to buy monochrome notebooks. Color improves the readability of text, especially on the smaller screens of notebook computers. In addition, many of today's applications clearly benefit from a color display, and the gray-scale differentiation used by even the best monochrome displays is a poor substitute.

SO LONG MONOCHROME

With a price differential of about $500, it makes little sense for users to buy monochrome notebooks. Color improves the readability of text, especially on the smaller screens.

So the choice becomes not one of monochrome or color but of which color technology.

Color notebook buyers have three basic choices of screen technology: passive matrix, dual-scan passive matrix and TFT active matrix.

TFT active matrix has already become the standard for high-end color notebooks. "The back-lit active matrix provides a dynamite-looking display. It commands a premium price, but it is the direction everyone wants to go. We believe it will become the de facto standard for all notebooks," Mack says.

IBM's early use of active matrix in its high-end ThinkPad notebooks was a key factor in the product's great appeal. A shortage of active-matrix screens kept ThinkPad prices high as demand outran supply.

But with new sources of active-matrix screens, the supply is catching up with demand, and even ThinkPad prices are dropping below $3,500. Other vendors offer active-matrix systems for less than $3,000. The recent earthquake in Japan reportedly disrupted the production of TFT displays, but analysts suspect that any slowdown in supply will be short-lived.

Passive matrix and dual-scan passive matrix provide less vibrant color displays and must be viewed directly from in front for the best effect. The dual-scan technology greatly improves the display by dividing it into two parts and scanning them simultaneously. This doubles the number of lines refreshed per second, which makes the screen easier to read and fulfills most users' portable needs. Thus, it kills the proverbial two birds with one stone. ■

Radding is a freelance writer in Newton, Mass.

Prices for dual-scan and active-matrix color notebooks

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AcerNote 735	$1,795
Compaq Contura 400C	$2,499
Dell Latitude	$1,799
Toshiba Satellite Pro	Starting at $2,999

ACTIVE MATRIX	
AcerNote 760CX	$2,995
Dell Latitude XP	$3,599
IBM ThinkPad 360C	$3,499
Zeos Meridien	Starting at $2,795
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Source: Prices were current for a number of trade magazines over the last four weeks and may vary depending on configuration

For more color notebook prices see the charts on pages 98 and 99.

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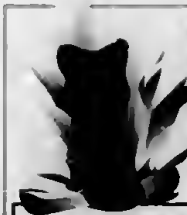
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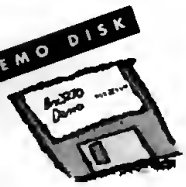
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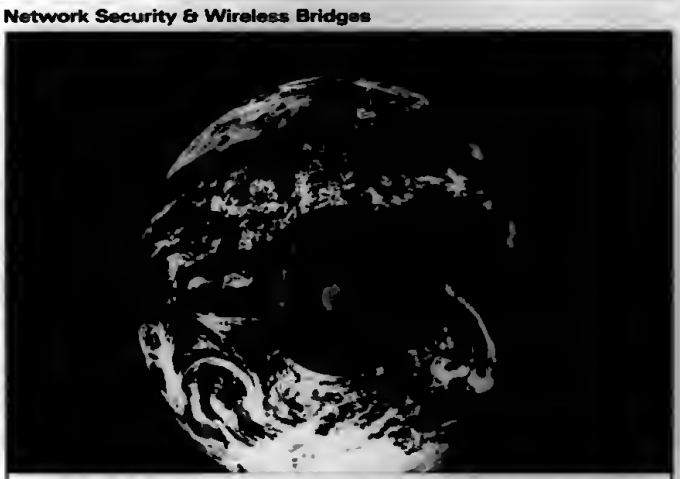
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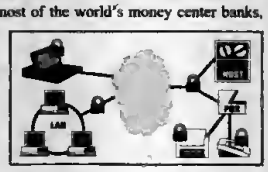
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Memorex Corp. 88
Merrill Lynch & Co. 1
Meta Group, Inc. 14,65
Micrografx, Inc 1
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Monash Information Services 6
Motorola, Inc. 65
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National Australia Bank Ltd. 88
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NCR Corp. 81
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NEC Technologies, Inc 45,104
Netcom On-Line Communication Services, Inc. 4,63
NetFrame, Inc 4
Netscape Communications Corp. 20
Network Computing Devices, Inc. 1,57
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New York Life Insurance Co 98
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Nippon Telephone and Telegraph 32
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Object Management Group 24
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OpenVision Technologies, Inc. 71
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Patricia Seybold Group 14,24,32
PeerLogic, Inc 24
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Peterson & Associates 1
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Profound, Inc. 65
Progress Software Corp 14
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Raima Corp. 83
Random Access, Inc. 32
Raptor Systems, Inc 32
Raytheon Engineers and Constructors, Inc. 102
Religious Technology Center 4
RenderMorphics Ltd. 8
RMO, Inc. 71
Ryland Mortgage Co. 10

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Sanford C. Bernstein & Co. 1
SAP AG 72
Securities Industry Automation Corp 53
Shawmut National Corp 8,28
Shiva Corp. 98
Siemens/Nixdorf Informationssysteme AG 15
Silicon Graphics, Inc. 32
Simplify Development Corp. 58
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Software AG of North America, Inc. 14,76
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Storage Technology Corp. 72
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Strategic Research Corp. 28
Summa Four, Inc. 32
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Sun America Financial, Inc. 28
Sun Microsystems, Inc. 1,6,7,14,32,49,57,58,71,76,81
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Tally Systems Corp. 58
Tandem Computers, Inc. 53
Technology Transfer Associates 1
TechSmith Corp. 98
Tektronix, Inc. 57
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Texaco, Inc. 14,32
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Visual Edge Software Ltd. 83
VMark Software, Inc. 82
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Wellfleet Communications, Inc. 63
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Feb. 24 Stock Ticker

Gainers

Percent

Sapiens Intl. Corp. N.V.	37.5
Parallan Computer	19.6
Rasterops	15.3
Borland Int'l, Inc.	13.8
Zeos International Ltd	12.3
System Software Assoc.	12.0
Cray Computer	11.8
Pencil Data Comm Networks	11.5

Dollar

BMC Software Inc.	5.19
Progress Software Corp	3.50
Autodesk Inc.	2.94
Micron Technology(h)	2.50
System Software Assoc.	2.50
Computer Associates(h)	2.25
Analog Devices Inc. (N)	2.00
LSI Logic Corp	1.88

Losers

Percent

Radius Inc.	-30.6
4th Dimension	-27.1
Newbridge Networks Corp	-25.9
Optical Data Systems Inc.	-25.8
Software Spectrum Inc.	-25.5
Intelligent Info. Systems	-24.3
Western Digital Corp.	-23.4
CE Software	-23.3

Dollar

Newbridge Networks Corp.	-6.38
Optical Data Systems Inc.	-5.25
Radius Inc.	-4.25
Apple Computer Inc.	-3.25
Software Spectrum Inc.	-3.25
Sybase Inc.	-2.88
Lotus Development	2.50
Xilinx	-2.25

The Dow Jones Industrial Average last week closed above 4,000 points. Rumors of a corporate takeover caused Lotus Development Corp.'s stock to drop 3½ points after officials dismissed the reports as "silly."

General Magic payoff delayed

Investors who jumped at **General Magic, Inc.'s (GMGC)** recent initial public offering might now be wondering how magical the deal really was. Although the stock soared from $14 to $32 in its first day of trading, shares are now hovering at a more sedate $19.

Analysts agree that this company is not going to turn investors into millionaires overnight. But some projected that in the long term, the investment could be a plum.

"Everyone wants a mind reader," said Bruce Lupatkin, director of equity research at Hambrecht & Quist, Inc. in San Francisco. He predicted that the potential for the broad application of Telescript, General Magic's intelligent agent technology, could bring shareholders nice returns if they are willing to wait.

"In theory, Telescript will be the kind of product that would be [useful] for almost any industry," Lupatkin said. A communications language with artificial intelligence, Telescript could be used with handheld devices to process a request while the user is away from the computer or using other applications. When the request is filled, Telescript would alert the user.

Unfortunately, analysts are not kidding when they say the pay off on General Magic will be "in the long term." It might be the 21st century before Telescript and the infrastructure to support it are ready.

Quite simply, the technology is too new. "Telescript is so futuristic it's not much more than an idea," said Sam May, an analyst at The Yankee Group in Boston. "It has great promise, but I would n't recommend betting your kid's college education on it."

"The earliest I'd expect a return would be by the year 2000," agreed Michael Murphy, editor of "The California Technology Stock Letter" in Half Moon Bay, Calif. He added that the long wait is no reason not to invest in General Magic. But investors should consider whether they can afford to hold the stock for several years before they see a return, Murphy said.

How can investors have faith in a technology and a market that basically do not exist? According to Murphy, the presence of corporate hackers such as Apple Computer, Inc. and Motorola, Inc. probably quelled potential shareholders' doubts.

"There's a lot of comfort when a company the size of Apple invests in a company like this," Murphy said.

—Erin Callaway

Exch	52-Week Range			Feb. 24 Vol Net Vol Pct Close	Change	Change
Communications/Inc Networks Services						Off 1.40%
OTC	53.25	20.13	3 COM Corp	30.25	0.88	1.0
NYS	44.38	36.25	AMERITECH Corp	42.63	-0.13	-0.3
NYS	57.13	47.25	AT&T	51.25	0.00	0.2
OTC	19.75	12.75	Banyan Systems Inc.	17.00	0.00	0.0
OTC	63.00	38.63	Bay Networks Inc	52.13	0.63	2.0
NYS	56.38	48.38	Bell Atlantic Corp	54.00	1.38	2.6
NYS	63.50	50.50	BellSouth Corp	59.50	1.00	1.7
NYS	28.00	18.00	Bolt, Beranek & Newman	26.13	-0.25	-1.5
OTC	15.75	9.00	Brooktrout Technology	14.50	-0.25	-1.7
NYS	53.00	33.06	Cabletron Systems	38.00	-1.88	-4.6
OTC	62.75	30.00	Centigram Communications	35.00	0.75	4.8
OTC	50.00	21.00	Cisco Corp	44.50	-0.38	-0.8
OTC	60.75	18.75	Cisco Systems Inc.	33.00	-0.00	-1.1
OTC	13.25	6.13	Compression Labs Inc.	7.75	0.00	0.0
OTC	11.25	5.13	Computer Network Tech.	7.00	0.13	1.6
OTC	21.75	7.50	CrossComm	13.00	0.13	0.9
OTC	4.13	2.00	Data Switch Corp	3.75	-0.06	-1.6
OTC	59.00	17.00	DSC Communications	35.25	1.50	-4.1
OTC	90.25	50.00	FORE Systems Inc	37.00	0.25	2.1
NYS	35.00	10.00	General Datacomm Inds.	23.13	-1.00	-5.6
NYS	44.88	37.50	GTE Corp	39.50	0.63	1.9
NYS	99.50	77.00	ITT Corp. (N)	99.13	3.75	1.1
OTC	27.75	37.25	MCI Communications Corp	19.75	0.13	0.6
OTC	15.75	7.50	MICOM Communications Corp	8.00	-0.25	-3.0
OTC	12.63	6.50	Microdyne Inc.	11.13	0.00	0.5
OTC	10.00	4.00	Netrix Corp.	8.63	-0.13	-1.4
NYS	53.00	33.06	Network Computing Devices	38.00	-1.88	-4.6
NYS	27.75	7.00	Network Equipment Tech.	26.50	0.50	1.9
OTC	28.00	15.88	Network General	27.25	0.50	1.9
OTC	8.38	5.06	Network Systems Corp	5.00	-0.25	-4.3
NYS	63.38	26.00	Newbridge Networks Corp	33.75	-4.38	-35.9
NYS	37.75	26.00	Northern Telecom LTD.	34.38	-0.13	-0.4
OTC	26.25	13.38	Novell Inc.	30.13	0.00	0.0
NYS	40.25	33.25	Nynex Corp	38.25	1.00	2.6
OTC	29.00	19.50	Octel Communications Corp	22.00	-0.38	-3.6
OTC	37.50	12.00	Optical Data Systems Inc	28.00	-3.25	-25.8
OTC	7.50	2.13	Pencil Data Comm Networks	3.63	0.38	11.5
OTC	28.00	10.00	Picturetel Corp. (N)	26.75	-0.56	-2.3
OTC	6.13	2.33	Proteon Inc.	3.63	0.50	8.2
OTC	12.38	2.75	Racotek Inc.	5.00	0.00	0.0
OTC	10.50	3.50	Retix	4.50	0.31	7.5
NYS	28.25	12.88	Scientific Atlanta Inc	19.00	1.13	5.1
NYS	54.38	50.00	Southwestern Bell Corp	41.13	-0.38	-0.9
NYS	40.13	35.88	Sprint Corp	25.88	0.00	0.0
OTC	31.63	33.38	Standard Microsystems Corp.	28.63	-0.50	-1.9
OTC	43.25	6.50	Stratacom Inc.	37.25	-1.00	1.0
OTC	15.25	5.00	Telebit Corp	5.31	-0.06	1.2
OTC	55.50	26.00	US Robotics	52.88	-0.63	-1.2
NYS	43.75	34.63	US West Inc.	38.63	-0.25	-0.6
OTC	28.25	32.75	Xircom	17.00	0.00	0.0
OTC	28.00	9.00	Xylogics Inc.	21.25	1.88	7.5
PCs and Workstations						Off 2.49%
OTC	7.50	3.50	Advanced Logic Research	6.38	-0.13	2.0
OTC	88.00	24.63	Apple Computer Inc.	38.88	3.78	-8.9
OTC	32.00	10.88	AST Research Inc.	16.13	1.00	-6.6
NYS	44.88	29.50	Compaq Computer Corp	34.75	2.25	-6.3
OTC	47.75	21.25	Dell Computer Corp.	43.31	1.94	-4.3
OTC	31.25	9.25	Gateway 2000 Inc.	19.25	1.19	9.8
NYS	116.63	71.88	Hewlett Packard Co (N)	115.75	1.25	3.3
NYS	35.38	38.75	Silicon Graphics	34.25	-0.50	-1.4
OTC	37.63	18.25	Sun Microsystems Inc.	31.75	1.69	-5.0
NYS	52.38	50.75	Tandy Corp	65.88	0.00	0.0
OTC	11.75	2.38	Zeos International Ltd	11.38	1.25	12.3
Large Systems						Up 1.67%
ASE	12.00	5.25	Amdahl Corp.	11.13	0.13	1.1
NYS	8.88	4.00	Cobex Computer	8.13	-0.19	-2.0
OTC	2.75	0.50	Cray Computer	1.19	0.33	13.8
NYS	53.75	16.63	Cray Research Inc.	36.25	0.13	0.8
NYS	12.00	6.63	Data General Corp	8.00	0.13	1.6
NYS	36.75	18.25	Digital Equipment Corp	23.75	3.63	-4.6
OTC	2.88	1.72	Encore Computer Corp	2.81	0.00	0.0
OTC	17.50	8.00	Harris Computer Systems Cor	16.75	0.50	3.1
NYS	78.00	51.38	IBM	70.88	-0.69	-0.8
OTC	17.25	9.00	Intframe	6.50	0.00	0.0
OTC	13.75	3.63	Parallan Computer	6.88	1.13	19.6
OTC	16.00	6.38	Pyramid Technology	15.88	0.00	0.0
OTC	21.25	11.13	Stardent Computer Sys	17.63	-0.13	-0.7
OTC	6.88	3.13	Sequoia Systems Inc.	6.00	0.38	4.9
NYS	39.88	22.88	Stratus Computer Inc.	27.00	0.50	1.8
NYS	19.75	30.50	Tandem Computers Inc.	17.50	0.13	0.7
OTC	21.00	3.88	TeCom Systems	3.63	-0.00	0.0
NYS	16.50	8.25	Unisys Corp	8.13	-0.13	1.4
Software						Off 0.35%
OTC	38.50	21.50	Adobe Systems Inc.	34.25	0.00	0.0
OTC	8.00	2.50	American Software Inc	2.94	0.00	1.2
OTC	61.00	23.25	Autodesk Inc.	38.69	2.94	8.2
OTC	5.38	1.75	Bachman Info Systems	4.50	-0.25	-5.3
OTC	29.00	20.50	BGS Systems Inc.	26.81	-1.19	-4.2
OTC	21.00	40.25	BMC Software Inc.	65.75	5.38	9.0
OTC	30.50	15.31	Bridge & Bamboo (N)	25.31	-0.44	-1.5
OTC	15.13	6.00	Broad Int'l, Inc.	8.75	0.06	1.8
OTC	22.29	6.00	Cadca Control Systems Inc.	6.75	-0.75	10.0
OTC	6.00	1.78	CE Software	3.25	-0.50	-13.3
ASE	30.25	6.00	Cheyenne Software Inc.	15.88	0.88	5.8
OTC	21.13	9.75	Cognos Inc. (N)	21.19	1.44	7.3
NYS	57.88	27.88	Computer Associates (N)	57.88	2.25	4.0
NYS	6.13	2.50	Computervision Corp.	5.38	-0.00	-0.5
OTC	49.25	31.25	Compuware Corp	37.63	-0.19	-0.3
OTC	17.25	9.00	Comshare Inc.	16.63	0.13	0.8
OTC	14.75	10.13	Corel Corp	12.75	0.75	6.3
OTC	14.25	7.25	Dataware Technologies Inc.	11.75	-0.25	2.1
OTC	6.75	2.25	Excel Corp	5.00	-0.69	3.0
OTC	33.75	14.75	Filenet Corp	31.00	-1.25	-3.9
OTC	12.13	3.00	4th Dimension	6.00	-1.81	27.1
OTC	39.25	8.38	Frame Technology	14.38	0.75	-4.6
OTC	35.25	11.50	FTP Software Inc.	27.13	0.75	2.8
OTC	10.00	7.00	Group I Software	9.50	-0.50	-5.0
OTC	31.00	8.75	Gupta	8.88	-1.50	13.2
OTC	30.75	4.63	Hogan Systems Inc. (L)	8.38	0.63	10.9
OTC	45.50	18.00	IMRS (H)	42.63	-2.13	-4.7
OTC	27.88	11.25	Information Resources	15.13	0.63	4.3
OTC	17.50	14.25	Informix Corp	17.63	-0.38	-2.1
OTC	13.75	7.88	Intergraph Corp.	12.31	-1.06	-7.9
OTC	8.75	2.00	Intellicorp Inc.	6.75	0.25	3.6
OTC	39.25	8.63	Isterson Inc.	15.00	-0.75	-4.8
OTC	73.25	27.00	Istuit Inc.	65.00	1.13	1.8
OTC	57.25	19.00	Legent Corp.	29.25	-1.00	-3.3

Exch	52-Week Range			Feb. 24 Vol Net Vol Pct Close	Change	Change
OTC	86.50	28.75	Lotus Development	63.00	2.50	3.5
OTC	18.75	6.38	Magic Software Enterprises	8.00	-0.13	-2.3
OTC	14.75	6.00	Mapinfo Inc's Group Inc.	10.50	-0.50	-4.5
OTC	27.00	14.75	Mapinfo Corp	25.21	0.00	-0.0
OTC	8.00	3.44	Mathsoft	3.25	0.19	6.3
OTC	21.25	6.50	McAfee Associates	21.00	0.38	1.2
OTC	17.25	8.38	Metron Graphics	13.50	0.63	4.9
OTC	20.00	11.00	Micro Focus	12.00	0.13	1.1
OTC	10.38	4.63	Microsmart Inc.	6.25	-0.25	-3.8
OTC	85.25	60.00	Microsoft Corp	81.31	0.88	1.4
OTC	45.00	18.25	Net Manage Inc.	37.00	0.00	1.4
OTC	31.50	37.50	Oracle Corp. (N)	20.75	0.17	0.9
OTC	40.25	21.50	Parametric Technology	40.25	-0.25	-0.6
OTC	34.50	33.38	PenePlace Systems Inc	10.00	-0.25	1.4
OTC	39.50	13.00	Peoplesoft	35.13	-0.00	0.2
OTC	8.00	4.00	Phoenix Technologies	7.25	-0.63	7.9
OTC	87.24	35.50	Powersoft	74.00	0.00	0.0
OTC	18.75	3.00	Platinum Software	8.00	-0.31	3.7
OTC	25.25	13.00	Platinum Technology (N)	21.75	-0.75	3.3
OTC	56.75	27.00	Progress Software Corp	54.25	3.50	6.9
OTC	6.38	1.88	Quarterdeck Office Sys	3.97	-0.16	-3.8
OTC	80.75	0.50	Rainbow Technologies Inc.	56.50	-0.63	3.6
OTC	8.00	2.00	Rasterops	3.13	0.69	18.1
OTC	7.13	2.88	Ross Systems	5.00	-0.06	-1.2
OTC	15.25	0.50	Saposs Intl. Corp N V	2.75	0.75	37.5
OTC	28.63	6.75	Softkey International Inc	24.13	1.88	-7.2
OTC	7.63	5.00	Software Publishing Corp	6.00	-0.13	2.0
OTC	10.38	5.00	State of the Art	8.38	-0.75	8.2
NYS	38.38	25.00	Sterling Software Inc	30.00	-0.25	0.7
OTC	16.50	3.63	Structural Dynamics Research	6.50	0.00	0.0
OTC	57.00	35.25	Sybase Inc.	45.25	2.88	-6.4
OTC	21.50	9.88	Symantec Corp	19.63	-0.75	-3.7
OTC	50.50	33.00	SynData's	40.00	-0.61	-1.5
OTC	23.75	10.63	System Software Assoc.	25.25	2.50	12.0
OTC	6.88	3.25	Trancz Corp. (H)	6.00	0.00	-5.5
OTC	10.00	7.88	Vermodoc Systems	10.00	0.13	1.3
OTC	23.75	12.25	VMark Software Inc.	15.00	0.50	-3.2
OTC	18.25	5.00	Walker Interactive Systems	7.38	0.25	3.5
OTC	60.00	29.25	Wall Data Inc.	48.25	-0.75	-1.7
Semiconductors						Off 1.46%
NYS	37.25	21.25	Advanced Micro Devices	29.13	1.50	-4.9
NYS	24.88	16.38	Analog Devices Inc. (N)	24.63	2.00	8.8
OTC	37.63	19.75	Atmel Corp	32.13	0.50	1.8
OTC	8.88	3.63	Chips and Technologies	8.50	-0.19	2.8
OTC	43.75	21.00	Cirrus Logic	32.63	0.00	0.0
NYS	28.00	13.88	Cypress Semiconductor Corp.	27.00	0.25	0.9
OTC	80.13	13.38	Dallas Semiconductor	56.50	0.88	2.3
OTC	31.88	16.75	Integrated Silicon Systems	20.63	-0.13	-0.6
OTC	80.75	54.00	Intel Corp	77.63	-1.63	2.1
NYS	13.00	10.75	LSI Logic Corp	53.50	1.69	3.6
OTC	55.25	34.75	Lattice Semiconductor	33.13	-0.75	-2.1
NYS	58.25	27.88	Micron Technology (N)	57.88	2.50	4.5
NYS	64.75	42.13	Motorola Inc	59.88	2.13	3.7
NYS	25.00	14.38	National Semiconductor	17.13	-0.63	-3.8
OTC	24.00	6.75	Sierra Semiconductor (H)	22.38	0.75	3.8
NYS	89.00	83.25	Texas Instruments	77.00	-0.00	-1.1
OTC	16.00	30.75	VLSI Technology	33.25	1.00	0.0
OTC	8.75	1.78	Weitek	3.13	-0.25	-7.4
ASE	20.50	13.00	Xicor Inc.	13.25	0.00	12.8
OTC	45.25	25.00	Xilinx	31.63	2.25	7.5
OTC	37.75	24.75	Zilog Inc.	32.38	-0.00	-2.8
Peripherals and Subsystems						Off 1.88%
OTC	30.50	14.50	American Power Conversion	17.88	-0.25	1.6
OTC	27.25	15.75	Barctec Inc.	16.00	-0.75	-4.5
OTC	5.71	3.75	Cambex Corp	3.75	-0.13	3.2
ASE	5.00	1.38	Cognitronics Corp	2.69	-0.19	-6.5
NYS	20.50	0.00	Comdel Peripherals	9.25	-0.88	-8.7
OTC	24.00	9.75	Creative Technologies Inc.	11.25	-0.75	6.3
OTC	9.25	3.50	Data Race Inc.	6.63	0.13	1.9
ASE	7.63	4.13	Datacom Corp	5.38	-0.25	-4.4
NYS	24.00	12.50	EMC Corp	17.13	0.25	1.5
OTC	15.31	3.13	Emulex Corp	15.31	1.00	7.1
OTC	17.50	11.25	Evans & Sutherland	12.50	-0.13	-1.0
OTC	24.00	14.00	Exabyte	18.88	1.44	8.3
OTC	59.13	1.88	Intelligent Info. Systems	1.38	-0.00	-14.1
OTC	8.00	3.50	Iomega Corp	6.06	0.56	10.2
OTC	6.25	2.00	IPI Systems Inc	4.00	0.00	7.7
OTC	26.00	17.00	Komag Inc	21.00	2.00	8.0
OTC	9.63	2.63	Maxtor Corp	6.31	-0.25	-5.6
OTC	11.00	4.88	Microphys Corp.	5.38	0.00	5.6
OTC	20.25	9.25	Pinnacle Micro Inc.	10.75	-0.75	-5.6
OTC	28.75	5.16	Printronix Inc.	18.00	-0.25	1.4
NYS	10.75	6.88	QMS Inc	7.00	0.00	0.0
OTC	20.75	11.63	Quantum Corp	14.63	-0.38	-2.5
OTC	10.25	7.38	Qualix Inc	8.75	-4.23	-28.4
NYS	14.13	6.38	Reynolds International	7.13	-0.00	5.0
OTC	7.00	4.13	Rexon Inc.	5.50	-0.38	-6.4
OTC	28.75	10.63	Seagate Technology	24.38	2.06	-7.8
NYS	41.50	21.00	Storage Technology	21.50	-0.75	-3.4
NYS	60.50	36.00	Tektronix Inc.	34.00	-0.00	-1.1
NYS	112.75	90.63	Xerox Corp	100.00	-1.63	1.5
Services						Off 0.00%
OTC	20.38	12.31	American Mgmt Systems	18.88	0.25	1.7
NYS	6.25	3.75	Analysis Inc.	3.13	-0.29	30.5
OTC	28.25	14.50	Analysts Int'l.	20.75	0.25	1.3
NYS	82.25	47.63	Auto Data Processing	62.25	0.75	1.2
OTC	20.00	14.00	Cambridge Tech. Partners	16.00	-1.63	-9.7
OTC	31.13	20.00	Cerdian Corp. (H)	31.13	1.00	2.3
NYS	26.13	17.75	Comdisco Inc.	25.50	0.25	1.0
OTC	18.00	8.25	Computer Horizons	16.13	1.19	7.5
NYS	52.63	35.13	Computer Sciences	48.38	1.75	-3.5
NYS	19.50	7.00	Computer Task Group	10.00	0.00	0.0
NYS	72.25	6.75	Comshare Inc.	10.00	0.00	2.0
OTC	51.00	9.00	Control Data Systems Inc.	6.81	-0.31	-4.4
OTC	12.13	6.13	Egghead Discount Software	10.75	0.00	0.0
NYS	40.13	31.63	General Motors E (EDS)	40.13	-1.15	-2.9
NYS	10.25	6.88	Inacom Corp	8.19	0.63	7.4
OTC	27.13	7.50	Intelligent Electronics	8.81	0.00	0.0
OTC	27.50	6.25	Manpel	6.00	-0.25	3.7
OTC	32.50	9.25	Mycroft Inc.	9.00	0.00	0.0
OTC	42.00	28.50	Policy Management Sys.	40.38	-0.63	1.5
NYS	47.75	25.75	Policy Management Sys.	42.63	-0.25	0.0
NYS	29.25	10.75	Reynolds and Reynolds	26.50	-0.38	1.4
OTC	25.25	16.75	SD Corp	20.75	0.72	3.8
OTC	57.88	32.13	Shared Medical Systems	34.88	0.00	0.0
OTC	8.13	6.00	SHL Systemhouse	7.75	0.00	3.3
OTC	21.50	9.25	Software Spectrum Inc.	17.75	0.75	15.5
OTC	42.00	31.50	Standard Data Systems (H)	41.25	0.75	1.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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IT TAKES HOURS AND HOURS AND HOURS TO GET A REVIEW LIKE THIS.



Battery life shines in Dell's Latitude

By Michael Fitzgerald and Paul Gillin

We spent several months on the road and at home using Dell Computer Corp.'s Latitude XP color notebook and developed a strong affection for the machine.

The Latitude XP is the Charles Lindbergh of its class. It makes the trip with power to spare. What's more, the lithium ion battery charges up in a jiffy.

The keyboard is solid and usable, and the price is outstanding for a notebook of this class.

Overall, Dell did a good job with the small details. For instance, the battery status gauge, an icon that tells you how much battery life is left, is always on display at the bottom of the screen.

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BankAmerica

CONTINUED FROM PAGE 1

Associates in Pasadena, Calif.

Other big banks in this arena include State Street Boston Corp. in Boston, Mellon Bank Corp. in Pittsburgh and Northern Trust Co. in Chicago, said Ronald I. Mandle, a bank analyst at Sanford C. Bernstein & Co. in New York.

"I'm a little bit suspicious," said Art Gillis, president of Computer Based Solutions in New Orleans. "I don't know many bank giants that would plead any kind of concern about the high cost of technology. They spend like crazy, and they get the best and the most."

In 1994, BankAmerica, which boasts $215 billion in assets, had an overall IS budget of approximately $790 million.

A BankAmerica spokeswoman said the decision to sell off its institutional trust division was a "resource" issue. "It was determined that alternative investments would better serve our customers and shareholders," the spokeswoman said.

> "I don't know many bank giants that would plead any kind of concern about the high cost of technology. They spend like crazy, and they get the best and the most."
> — Art Gillis, Computer Based Solutions

Money matters

Experts estimate that BankAmerica, based in San Francisco, would need to invest roughly $50 million to add front-end and middle-office client/server technologies. These would supplement the existing mainframe and Digital Equipment Corp. VAX systems that now support its corporate trust business, which earns between $150 million and $200 million in annual revenue.

BankAmerica has the financial wherewithal to make the necessary IS investments, according to Richard T. Griffith, a former group executive vice president who retired last summer as head of BankAmerica's trust operations. The reason it has declined is simple: Corporate trust management is no longer a big moneymaker, he said.

Ironically, technology itself has contributed to the declining margins, which make large volumes all the more critical for banks in the business.

"Today, since almost everything is paid electronically, the float [the time between the deposit of a check in a bank and payment] is almost zero," Griffith noted. Consequently, "there are low margins and only a few banks that believe they can amass the economies of scale" to be profitable in the corporate trust business, he added.

BankAmerica's planned exit from the corporate trust business is also in line with a broader industry trend toward consolidation and specialization. Most banks have farmed out or sold noncommission-critical businesses.

BankAmerica also has a checkered history in implementing technology to support corporate trust business. In 1987, a premature cutover to an employee benefit trust system known as Master Net nearly brought that business to its knees.

"It was a big brouhaha at the time. The systems problems cost both the CIO and the trust vice president their jobs," recalled Peterson, then an executive at Security Pacific Corp., which merged with BankAmerica in 1992.

Today, by contrast, Griffith said whoever buys BankAmerica's corporate trust business will acquire "some very good technology" in the process. As part of the Security Pacific merger, BankAmerica acquired "very good Speedway software for securities clearance," Griffith said.

"In this whole potpourri, there is some good technology and software that I suspect would bring a good premium," he said.

Independence One Mortgage wins the *"Computerworld* Re-engineering Team of the Year" award. See page 88.

App vendors push for integration standards

By Rosemary Cafasso

The big guns in the client/server applications market last week teamed up to form an alliance that intends to publish integration specifications within a year.

If the Open Application Group (OAG) makes good on this promise, it could be a big boost to many users who are struggling to link a mixed bag of applications. The OAG said it will issue specifications that developers can use to write their software in a consistent manner. The group plans to provide a level of detail down to the total number of characters in a purchase order number.

"Historically, no one supplier has been able to do it all," said Herb McCauley, vice president of information management at Harris Corp. in Melbourne, Fla., which uses Dun & Bradstreet Software's client/server applications. "With this concept, it would allow you to pick and chose applications."

Different approaches

Currently, integration between applications is a time-consuming task because no two vendors take the same approach to application design.

The group said it will first work on integrating various business applications. This would ultimately allow one software vendor's financial application to share information with another vendor's manufacturing software.

The OAG will later provide specifications to link business applications to such niche products as banking software.

Members of the OAG include American Software, The Coda Group, D&B Software, J. D. Edwards & Co., Marcam Corp., Oracle Corp., PeopleSoft, Inc., SAP AG and Software 2000, Inc.

Users opt for CDs

CONTINUED FROM PAGE 1

kettes or producing piles of paper documentation.

However rosy CD-based software may look for users and vendors, it is expected to take a toll on resellers. And the ramifications could come back to haunt users and vendors.

For now, the advantages of using a CD as software media — a single disc can hold one-half gigabyte of data — are primarily drawn from the speed and ease with which it enables users to distribute and install increasingly larger software applications.

For example, Everhart recently loaded Borland International, Inc.'s C++ off CD-ROM and on to a workstation at his site. "Let's put it this way," he said. "If I tried to install the 25 diskettes [for one application], it'd take me all day. Using the CD, it took me one hour. Imagine if that were one of the applications we put on all of our 2,000 users' desktops."

> **However rosy CD-based software may look for users and vendors, it is expected to take a toll on resellers. And the ramifications are going to come back to haunt users and vendors.**

While CD-ROM titles are still mostly sold for home use, applications sold to corporate sites are the fastest growing segment in CD software sales, according to the Software Publishers Association (SPA) in Washington. SPA members' sales of languages and tools on CD for the first nine months of 1994 skyrocketed to $62 million, compared with only $334,000 in revenue for the same period in 1993. In fact, Lotus Development Corp. in Cambridge, Mass., said CD-based software sales doubled, from 10% of sales in 1993 to more than 20% in 1994.

CD advantages

For vendors, the benefits of moving to CDs are substantial. CD-ROM media is much cheaper for manufacturing software than disks, said Lisa Underkoffler, director of product management for SmartSuite at Lotus.

Today, SmartSuite, like all application suites, is shipped on a CD and diskette. The CDs cost Lotus about $1 per disc, Underkoffler said. By comparison, the 27 3½-in. diskettes in SmartSuite cost Lotus between 60 cents and $1. If the diskette media were removed from the box, it would cut up to $27 off the product's packaging cost.

But the biggest and most likely changes will occur in how users actually buy the software. The three major software vendors — Microsoft Corp., Novell, Inc. and Lotus — are considering buying options that bring the equivalent of Chinese food menus and movie trailers to software applications (see box).

Because CD-ROMS can store more data, they can also store complex technologies such as encryption. This will allow a vendor to offer dozens of applications on one platter. Vendors are already beginning to advertise preview-only versions of other products with the applications that they ship. And by encrypting licenses on CD-ROM, users can download a new application by buying a "key" from the reseller.

However, the most innovative approach is due to be launched by WordPerfect, the Novell Applications Group, with its CD-based version of PerfectOffice. Users are closely watching the product because it would give them discounts similar to what they would otherwise garner from a reseller.

By offering a Chinese-menu variety of their own and other companies' applications, vendors will allow users to mix and match applications under the same interface. And the more applications that PerfectOffice Select users choose off the disc, the greater the discount.

Should the WordPerfect model catch on with users, it would become a major vehicle for software purchases. Microsoft officials are experimenting with their own encryption technology called Ali Baba, said Mike Losh, group manager of emerging channel strategy at Microsoft. He said Microsoft has yet to determine whether to put a feature in Windows 95 that would let users to unlock Microsoft applications at their desktop.

How CD technology is changing packaging tactics



WordPerfect is packaging its PerfectOffice suite with third-party titles. It will include a feature that allows users to gain preprogrammed discounts tied to the amount of applications they choose from the CD.



Microsoft is preparing the reseller channel for its CD-based offerings, which are compiled in a package called CD Store. If implemented, users would be able to buy software over the telephone.



Lotus is preparing to use CD-ROM technology to package a variety of different software bundles that could ship by the end of the year.



IBM is now using CDs to offer titles such as WordPerfect's word processor and Lotus' 1-2-3.

INDUSTRY PULSE: PC software

Top-selling worldwide business applications by revenue

Vendor	Application	1994 revenue*
Microsoft	Office for Windows	~$1.4B
Novell	WordPerfect for Windows	~$400M
Lotus	SmartSuite	~$220M
Microsoft	Excel for Windows	~$215M
Microsoft	Word for Windows	~$207M
Lotus	Notes	~$177M
Lotus	Lotus 1-2-3 Release 4 for Windows	~$161M
Novell	WordPerfect for DOS	~$120M
Microsoft	Project for Windows	~$113M
Microsoft	Office for Macintosh	~$104M

Source: Dataquest, Inc., San Jose, Calif. *Preliminary estimate. Individual application numbers do not include sales within suites.

Software product feature requirements

Percentage of sites rating feature as very important

Overall ratings

Support	72%
Ease of use	71%
Features/Performance	67%
Compatibility	52%
Documentation	47%
Price	42%
Vendor reputation, size	25%
Multiplatform support	25%
Scalability	24%
User groups	9%

Additional PC ratings

Windows compatibility	70%
Hot-line support	57%
Standards support	36%
Removal of copy protection	8.8%
Site licensing	2.0%
Limited liability for copying	1.2%
OS/2 compatibility	1.1%

Base 1,626 software professionals

Source: Sentry Market Research, Westboro, Mass

Where the money is spent

Average software site expenditures (PCs, LANs or servers running desktop-oriented systems)



1994 top PC software growth categories

- Workflow management/Mail
- Multiuser, client/server database management systems
- Fourth-generation languages
- Application development tools

Base 1,626 software professionals

Source: Sentry Market Research, Westboro, Mass.

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Inside Lines

it's up — they're still down

Borland's stock rose "sharply" on Friday — more than 1 point, according to Wall Street analysts — following rumors that the firm had settled its copyright infringement lawsuit with Lotus. Borland officials did not return calls before press time. But a Lotus spokesman said the lawsuit had not been settled. He would not comment on whether the two parties are currently discussing a settlement.

Stand by your OS

The drip, drip, drip of news stories about the fate of OS/2 caused enough internal doubt and pain to prompt IBM software chief John M. Thompson to send out a memo reaffirming that the firm is "absolutely" standing by its operating system. To hammer home the message, he used the word "committed," or variations thereof, a total of six times in seven paragraphs. He ended with an admonition to the troops to buck up, lose the low morale and "spend our time figuring out how to win. The question of whether or not to do battle has already been decided." Onward, OS/2 soldiers!

Seconds, anyone?

IBM's mainframe operation plans to start shipping the second-generation version of its CMOS-based System/390s in June and should be at full volume by October, sources said. The machines will use a faster microprocessor expected to run at about 21 MIPS — a 50% jump from the initial chip, which was released last year.

Kittyhawk to take flight

Hewlett-Packard next week will introduce a line of multiprocessing HP 3000 servers developed under the Kittyhawk code name and based on the fastest version of HP's PA-RISC chip, the PA-RISC 7200. It will scale up to four processors, doubling the two-processor limit of the predecessor chip. Kittyhawk used to be the name of a 1.3-in. storage module HP discontinued last September.

Making beautiful routers together?

Whispers of an impending joint-partnership deal between Cisco and Compaq were in the wind. While it's no secret Compaq wants to get into the networking market, sources at Cisco denied that a deal would be announced any time soon. Compaq refused to confirm or deny the rumors. But one Cisco insider confirmed there was talk of a deal under which Compaq would incorporate Cisco's AccessPro 2500 router-on-a-card into Compaq's server line.

Getting portable

Chip maker Advanced Micro Devices is readying a chip for the portable market, according to sources close to the company. The low-power 3.3V, 100-MHz 486DX4 chip will be announced in June and start shipping in the fourth quarter.

The latest revolution on spin control

Look out Ted Turner and Ted Koppel. Here comes Bill — Gates, that is. As if dominating the software industry weren't enough, the man who put the Bill in billionaire is getting into the news business, and Microsoft is currently setting up a newsroom of its own. So first there was Microsoft TV (MTV?), then the Microsoft Network (MSN) and now MNN. But will they get James Earl Jones to do the voice-overs?

Remember when former Apple chieftain John Sculley's likeness and words of wisdom seemingly graced the pages of some national news publications week in and week out? Sculley's wife, reached at their Connecticut home last week, said he would not comment on last week's Apple/Microsoft blowup. "Apple is our past; you have to move on in life," she said. In the spirit of moving on, will Sculley comment on what he's doing these days? "No," Mrs. Sculley said. "He's not talking to the media — ever again in his life." We hope you don't feel the same way. If you care to comment on news, you can reach Computerworld *on our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or on the Internet at mjohnson@cw.com.*

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